H. Hoyle Butts,
September, 1896.

Plate I

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SORE THROAT,

ITS

NATURE, VARIETIES, AND TREATMENT;

INCLUDING THE CONNECTION BETWEEN AFFECTIONS

OF THE

THROAT AND OTHER DISEASES.

BY

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PHYSICIAN TO THE HOSPITAL FOR DISEASES OF THE THROAT AND CHEST:
LATE PHYSICIAN TO THE NORTH LONDON CONSUMPTION HOSPITAL.

FIFTH EDITION,

ILLUSTRATED WITH HAND-COLOURED PLATES.

LONDON:
J. & A. CHURCHILL, NEW BURLINGTON STREET.

1886.

PREFACE TO THE FIFTH EDITION.

SOME apology may be due for the delay in the issue of this edition.

It seemed undesirable to reprint on the eve of the International Congress, and when the valuable material there produced had been digested, the pressure of other work prevented attention to this. Only last year was I able to redeem a promise to produce a volume on "The Therapeutics of the Respiratory Organs" for "Wood's Library of Standard Medical Authors." That work, considerably larger than this, appeared in New York last December and the following April in London.

Meantime an enlarged edition of my "Laryngoscopy and Rhinoscopy," which also had been long out of print, was published, and it was intended that this work should follow in October, but the issue of a new "British Pharmacopœia" in September induced me again to postpone this edition in order to prepare a "Guide" to the changes made in the official formulary. A second edition of that "Guide" was called for almost immediately and caused still further delay

The numerous references to researches published within a year or two will suffice to show that advantage has been taken of this delay to revise the work in the light of the most recent investigations. One of these, Mr. Horsley's, though cited at some length in the concluding chapter, has in fact not yet been printed.

PROSSER JAMES, M.D.

3 DEAN STREET, PARK LANE, W.,
December 12, 1885.

PREFACE TO THE FOURTH EDITION.

THE third edition having been sold in a little more than three months, was reprinted in time for the opening of the last Winter Session. This reprint, in its turn, having been disposed of before the close of the academical year, the author has devoted his vacation to the revision of his work.

Some alterations in arrangement have been made; the remarks on classification, omitted in the last edition, have been restored; many passages have been condensed, though many more expanded; several sections have been inserted —*e.g.*, that on Stammering of the Vocal Cords; and fresh paragraphs have been interspersed throughout the work. Four entirely new chapters [XII., XVI., XVII., XVIII.] have also been added. Thus the bulk of the book has been augmented, but it is hoped the greater completeness thereby obtained will be found associated with increased usefulness.

The Plates are again new. The lithographic stones having been considerably worn by the two issues of the last edition, the author has selected a new series of cases for his illustrations. These have been now engraved on copper and coloured by hand.

PROSSER JAMES, M.D.

3 DEAN STREET, PARK LANE,
October 31, 1879.

PREFACE TO THE THIRD EDITION.

THIS little work originally appeared at the close of 1860, and, in accordance with publishing custom, bore on its title-page the date of the approaching year. It was the first, and for about three years continued to be the only English book on the Laryngoscope—an instrument, the value of which was recognised throughout.

At the end of 1865 an illustrated edition was issued, in which five lithographic plates exhibited as many methods of employing the laryngoscope. These plates were copied from photographs, with which it was originally intended to illustrate the work; but the photo-printing was attended with so many delays, that while passing the previous winter on the Continent, I had them transferred to stone by a foreign process.

Those lithographic illustrations have served the purpose for which they were first designed, and therefore, are not now re-produced. Instead of them I have added to this edition two much more costly coloured plates, on which are depicted twelve examples of laryngeal diseases, drawn and painted from life by the aid of the laryngoscope. They are selected from cases occurring in my own practice, and some of them are of especial interest, not only as illustra-

tions of disease which can only be certainly detected and efficiently treated by the aid of the laryngoscope, but as additional demonstrations of the accuracy of my former observations respecting cases of recovery from morbid conditions usually considered incurable.

In some "Clinical Illustrations of Diseases of the Throat and Lungs," contributed to *The Medical Press* in 1872, I recorded two examples of recovery from advanced laryngeal phthisis, having previously brought some before the Britisn Medical Association. A picture of one of these appears in my "Laryngoscopy and Rhinoscopy," and another will be found in the present volume. These and other satisfactory instances of recovery from advanced consumption, impel me to repeat my assertion that neither laryngeal nor pulmonary phthisis should be abandoned as hopeless.

The delay in the appearance of this edition has been quite unavoidable. Seven years since, in compliance with the wishes of pupils and friends, I expressed a determination to revise the book. A little later an eminent foreign professor favoured me with a visit, during which he preferred a similar request, urging that for several years he had used it as a text-book in his class. Stimulated by this, I readily undertook to set about the revision, but a series of acute rheumatic attacks interposed to prevent the execution of my purpose. At length, on resuming practice after the rest enforced by a season of severe suffering, one of my first cares has been to redeem my promise by preparing a new edition. In doing so it has been a gratification to find how little I have had to retract from the teaching laid down so long ago. Some of the doctrines then thought novel have been widely adopted, the remedies I recommended are now regularly prescribed, those I discountenanced have been gradually abandoned, and the only statements I

made which provoked opposition have become generally accepted.

Considerable additions have, however, be made to the work, which is so far rewritten as to coincide with the further experience acquired in the years that have elapsed since the last edition, during which favourable opportunities for observation have been afforded me as physician to the Hospital for Diseases of the Throat, as well as other public charities, one of them a Hospital for Consumption.

Still, I am by no means unconscious of the shortcomings of my work, though I venture to hope it will again be found useful to my professional brethren, and not altogether unworthy of the position their confidence has conferred upon me, and which it has always been my endeavour to deserve.

No doubt the additions may be detected by their difference in style, especially as in making them no circumlocution has been resorted to in order to avoid the use of the pronoun I. In extenuation of this I might plead that professional labour seems naturally to produce a tendency to employ dogmatic modes of expression. But, indeed, I am ready to admit that, at this date, I feel entitled to make assertions which twenty years ago it was natural to put in the more modest form of suggestions. Moreover, as the first English worker with the Laryngoscope, it seems to me as well thus to signify my acceptance of such responsibility as may attach to my teaching.

PROSSER JAMES, M.D.

3 DEAN STREET, PARK LANE
May, 1878.

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SORE THROAT.

CHAPTER I.

NATURE AND VARIETIES OF SORE THROAT.

THE word throat is used in several senses. Thus it serves first of all to designate the front of the neck, and this meaning is sometimes so far extended as to embrace the sides, and occasionally, though with less propriety, the whole circumference of this part of the body. With a little more precision the word is applied to the wind-pipe and gullet, or one of them; and again it is further restricted to the interior surface of either or both of those passages for air and food. It may be thought that these indefinite uses of the word are rather inaccurate; but classical authority may be cited in their favour, and they are firmly established in our language. The next meaning of the word throat is to discriminate those parts which lie beyond the mouth, but can be seen on looking through that cavity—the fauces, as we say technically—the

"back of the throat," as our patients frequently phrase it. Since, on careful inspection, we can discover parts of several organs, the whole of each of these may naturally be included in the term.

In a secondary sense the English word throat also means a roadway, generally speaking, a narrow defile or gorge. The same latitude of meaning belongs to the Latin word *fauces*, which was used for a pass, or outlet, or narrow way. *Corinthus posita in angustiis atque in faucibus Græciæ.*—Cic. But the primary meaning was that of the part of the body. Pliny said *Summum gulæ fauces vocantur, extremum stomachus.* As gula usually meant gullet, the pharynx might appear to be intended, but it is clear from other passages that the word was not thus restricted. In fact, fauces corresponds very closely with our own word throat, which comes to us direct from the Saxon *throte*, and as it is found in several other of the Aryan languages, was probably derived from the Sanscrit *tri* and *ut*, meaning to pass through or go beyond. The Greek word pharynx (*φάρυγξ*), which we have adopted for a single organ, seems to have been used classically with almost equal latitude; but for our secondary meaning of defile, or ravine, the kindred word *φάραγξ* was often employed, the two corresponding very closely with the Latin fauces, which, in fact, most likely came from the same root, *φάρω*, cleave, cut, or divide, this verb being but a changed form of the Sanscrit *phal*, signifying a joint opening, or cleft.

The throat is often described as the roadway from the mouth and nose to the stomach in one direction, and the lungs in the other. It would give a better

idea, perhaps, to compare it to the junction of two curved roads which cross each other and then run a parallel course. One of these, the channel for food, goes from the mouth backwards into the throat, crossing the other at the summit of the larynx, where the epiglottis falls like a drawbridge as the food passes over into the pharynx, whence it is despatched along the gullet or œsophagus downwards to the stomach. The other road is for air, and may be said to start from the nose, taking its way along the posterior nares into the throat, where it bends rather abruptly forwards, and having crossed to the front of the food channel, continues its course downwards along the larynx, trachea, and bronchi, to the lungs.

If further illustration were required, we might compare the throat to a narrow defile through which both air and nutriment must find access to the body, where accordingly two roads coming from the exterior converge, and from which two other roads lead to the interior,—to say nothing of smaller passages, such as that which leads to the ear, and thus brings that organ into intimate connection with the throat.

From what has been stated it will be seen that the air has free access from the open mouth as well as through the nose. The respiratory passage is always open, except during the act of swallowing, when, as we have seen, the epiglottis closes it below, so that nutriment can pass over. At this moment it is also necessary to shut off the upper part of the air tube in order to prevent the aliments from entering the nose. This is accomplished by the soft palate, which here playing

the part of a swing-door or gate, closes the nares during deglutition, but immediately afterwards resumes its usual position, where, hanging like a loose curtain from the hard palate, and therefore appropriately named *velum pendulum palati,* it separates the mouth from the throat more or less completely, according to the constantly varying degree to which it descends or is drawn up.

The loose border of the *velum* is so shaped as to make it resemble a scalloped valance or looped-up curtain ; for this free edge in its course from one side to the other describes two arcs, separated from each other by a conical prolongation, which descending between the two is common to both, and is named the *uvula.* The two concave or retracted segments are called the arches of the fauces. From these the outer bounding folds are continued downwards—one on each side—as low as the floor of the mouth, so as to form a pair of columns or piers from which the arches may be said to spring, and which are named the pillars of the fauces. Thus the uvula appears as one imperfect division between the two arches which communicate below. When the velum is completely retracted, the central part is drawn up so much higher than the sides, that the two concave segments seem thrown into each other, so that we have only a single arch spanning the distance from side to side, supported on the two pillars, with the uvula looking like a mere ornament suspended from the keystone. Examining the parts a little more closely, we see that there is a second pair of columns, one standing in front of the other ; they are distinguished as the ante-

rior and posterior pillars. At their summits both pairs converge, so that all four are lost in the base of the uvula; but tracing them in the opposite direction, we observe that the distance between the anterior and posterior pillars increases as they descend, since the former are prolonged to the sides of the tongue, while the latter are directed backwards to the pharynx.

Thus on each side there is enclosed a rather triangular space in which lies the tonsil—an oval body, on the surface of which several lacunæ are visible. The constricted aperture between the mouth and throat, bounded by the parts just mentioned, is called by anatomists the isthmus of the fauces. In resorting to geography for a name, it would have been better to have borrowed the word straits; for we have to do, not with a solid part, but with a channel, a mere empty space, bounded by the solid organs. This being so, it is obvious that a mere communication between two cavities can suffer no change, except as to its size and shape; and even these are only altered indirectly, through changes in the boundaries. It is therefore with the organs which bound this channel—the shores of the straits (isthmus)—that we have to do in disease.

Beyond the isthmus lies the cavity of the pharynx, of which the posterior wall, immediately in front of the vertebral column, faces the observer and bounds the view. How much of this wall can be seen, depends on the extent to which the velum is retracted and the tongue depressed. In some cases, inspection also reveals the tip of the epiglottis, standing erect like a sentinel on guard at the opening into the larynx. But to

see this valve satisfactorily we must employ a mirror and suitable illumination. The skilful disposal of these enables us to look behind the velum, so as to examine its posterior surface and explore the pharyngeal cavity, including the roof or vault above, the passages into the nose, the ends of the Eustachian tubes leading to the ears, and in fact the entire surface of the walls of the pharynx, which is continuous below with the œsophagus. Posing the mirror so as to reflect the rays into the larynx, we may also illuminate the interior of the organ of voice, and watch the intensely interesting movements of its several parts, besides which, with a little dexterity, we may trace the trachea in its course, and sometimes see the bifurcation of the bronchial tubes. How all these ends are to be attained will be shown when we come to speak of Laryngoscopy and Rhinoscopy.

If the reader will now be good enough to inspect some friend's throat, or his own by the aid of a mirror, he will have recalled to his mind a more vivid notion of the relations of the several parts we have mentioned than the most careful detailed description could convey. Nothing more is necessary at this stage than to remind him that the mucous membrane which covers these parts is continuous, is, in fact, a portion of the great gastro-pulmonary tract, which, commencing at the lips, eyelids, and nostrils, passes back through the mouth, throat, alimentary canal, and air-passages, thus lining the inside of the body, just as the skin does the outside, the former being always moist, the latter comparatively dry. The continuity of these structures ought never to be lost sight of.

Their analogy is closer still; in structure and function they are very similar, and indeed they appear to run into each other. A single glance at the lips suffices to show that it is not easy to tell where the external skin ends and the internal one begins. There is no distinct line of demarcation between the skin and mucous membrane; they glide insensibly into each other; in a word, they are continuous. In certain circumstances, when the conditions of the one get imposed upon the other, they become readily transformed into each other, and so go far to show that in essence they are but one, the difference between them depending on the conditions to which they are subjected. This is a beautiful instance of Nature's simplicity, and we may well admire her handiwork when we contemplate this exquisitely-fitting garment, woven without seam, adapted by a hundred variations to every office it has to fulfil, covering the body outside (skin), and lining it inside (mucous membrane), winding through every turn of the wondrous labyrinth, and enclosing in its folds the strange machinery of life.

Reduced to its simplest form, mucous membrane may be described as consisting of a very fine lamina mounted on a network of blood-vessels, and covered by epithelium. In the same rough manner it may be stated that the blood is brought to the part by the vessels, that some of its constituents ooze through, and, together with cast-off epithelium-scales, form the secretion. We must, however, be a little more definite. A mucous membrane consists of two distinct layers, the deeper corresponding with the true skin, *cutis vera* or *corium*, and the superficial corresponding with

the scarf-skin, cuticle, or epidermis, and named epithelium. It should, however, be observed that this superficial layer is not merely protective, but discharges a more important function in relation to secretion.

Beginning with the deepest layer—the *fibro-vascular base*—we find it composed of networks of blood-vessels and lymphatics supported and united by connective tissue, areolar and retiform. It is of various degrees of thickness, and arranged, sometimes in prominences, called papillæ or villi ; at others in depressions, called crypts, follicles, or lacunæ ; and again, in involutions called glands. The deepest layer of the corium is formed of bundles of non-striated muscular tissue running either longitudinally or circularly, and often in both these directions. This layer is sometimes distinguished by the name *muscularis mucosæ*, and lies immediately upon the areolar sub-mucous tissue to which mucous membranes are attached. The superficial boundary of the corium may mostly be made out as a distinct layer dividing it from the epithelium, and called the primary or basement membrane (*membrana propria*) which is so delicate that it long defied all attempts to make out its structure, and was therefore called a simple, transparent, homogeneous layer. But by treatment with nitrate of silver, it has been shown to consist of flattened epithelioid connective-tissue cells, more or less fused together by their edges. This basement membrane in some parts—*e.g.*, the cavity of the tympanum and the nasal sinuses—is so fine, if indeed it exist, that it cannot be demonstrated.

The epithelium is made up of nucleated cells arranged in one or more layers, probably adhering together by some intercellular substance, which, as it exists in only minute quantity, cannot be demonstrated. From the variety which occurs in the shape of the cells, epithelium has received different names. Where the cells are simply spherical or globular-shaped bodies the epithelium is called *spheroidal;* when they are flattened out into scales or plates, it is variously termed *squamous*, *scaly*, *tesselated* or *pavement* epithelium Again, when the cells are lengthened out into a prismatic, or pyramidal form, and set upright on the surface, it is *columnar* or *cylindrical* epithelium. When the cells assume intermediate forms between those above mentioned, the fact is sometimes expressed in the term *transitional* epithelium. Lastly, the cells may be furnished with minute hair-like filaments called *cilia*, which are in constant active movement in a definite direction, this movement continuing for some time after death. This variety, which is of great interest in relation to our subject, is termed ciliated epithelium. Ciliated cells are usually of the *columnar* form, and their *cilia* are placed on the free bases. It is the epithelium which gives the smooth surface to mucous membrane, and to its cells belongs the more intricate part of the act of secretion. These cells, as they grow, appropriate to themselves their own proper nutriment. Having attained perfection, they exist for a short time, and then bursting or dissolving, give themselves and their contents to form the secretion. Each individual cell thus goes through the stages of life—arrives at ma-

turity and passes away—an exact picture of the economy of which it forms so small a portion.

In the submucous tissue the blood-vessels divide into numerous branches. These penetrate the corium, and there form a network of capillaries in immediate contact with the basement membrane, advancing with it into the papillæ, and receding with it to surround the tubular or glandular recesses. Similarly the lymphatics form networks which communicate with plexuses in the submucous tissue.

The nerves of mucous membrane are also freely distributed in the fibro-vascular layer into which it is comparatively easy to trace them, but they are also found to penetrate the basement membrane. In the palate they have even been traced between and among the epithelial cells, and the most recent researches seem to indicate that filaments penetrate the cell walls.

Looking at mucous membrane as a secreting apparatus—had it simply covered the internal surface it would not have sufficed for the purposes of animal life, and consequently some contrivance was needed to augment its extent. That end is attained by making the surface irregular—sometimes this is done by protrusions, but much more frequently by recesses, as already mentioned. A simple *cul de sac* of mucous membrane forms a crypt, follicle, lacuna, or glandule. Such a blind pouch may be lengthened out and coiled up; much more frequently it branches out or subdivides in various ways. Thus glands—so far as we have here to do with them—may be defined as dispositions of mucous membrane for the sake of providing a greater secreting surface. Their shape depends on

the connective tissue which supports the vessels and unites the branches. They are often enclosed in a fibrous envelope, and are always supplied with nerves and lymphatics. The same contrivance is adopted in other cases. The intestines are coiled on each other, and the capillaries wind and flex into a most amazing network, just as these elevations, depressions, and involutions pack into a small compass many thousand inches of the secreting membrane.

The portion of the mucous membrane with which we are now concerned is studded with innumerable depressions, commonly called the follicles of the throat. In them secretion goes on actively; possibly, too, its product may be somewhat different from that of the plane surface. The tonsils may be ranked between these and more perfect glands. On their surface may be seen upwards of a dozen openings leading into recesses, from which in their turn other but smaller orifices lead into numerous follicles. These are lined by mucous membrane, and surrounding their walls are a number of closed capsules; whether they discharge their contents by bursting is undecided. Very similar to these are a series of follicular recesses at the root of the tongue, forming a layer extending from the papillæ vallatæ to the epiglottis, and from one tonsil to the other. The salivary glands are perfect secreting organs of their class, elaborating important fluids, and possessing ducts to convey these fluids to their destination.

The act of secretion is modified by many circumstances to which living beings are subjected. From what has preceded, it will be anticipated that an

unusual flow of blood to a part will cause an extra amount of secretion, while a diminished supply of the vital fluid will give rise to an opposite effect. Yet the sequence is not so invariable that diminution or excess may always be thus easily accounted for. Other disturbing and counteracting agencies are often at work. The tone of the capillary system seems to have a wonderful effect, for in a relaxed state more fluid escapes than in health, giving rise to hyper-secretion or passive hæmorrhage. An unusual quantity of the material secreted getting into the blood, has to be eliminated by an increased activity of the organ which usually secretes it. Again, the presiding nerves have considerable influence over the act, as proved by stimulants to them augmenting the flow. Through the nervous system certain mental states find expression by an increased or decreased secretion. The effects of joy, grief, anxiety, or contentment on the skin, kidneys, and bowels are familiar to all. In many instances emotion increases secretion, but sometimes a contrary effect is produced. There must be few who have not seen diarrhœa thus set up. It may in the same way be arrested. I have known the sudden death of a relative completely arrest a diarrhœa which had continued in spite of various remedies. The liability of the salivary glands to refuse to work from mental anxiety is probably the foundation of the Indian method of detecting a thief, in which the parties implicated are compelled to chew rice, and spit it out on a leaf. He who has not saliva enough to wet it is judged guilty.

The preceding sketch of the anatomy and physio-

logy of mucous membrane affords an advantageous standpoint for glancing at its pathology, to which we now turn.

CONGESTION AND INFLAMMATION OF THE MUCOUS MEMBRANE.

In entering on the diseased state of the lining of the throat and air passages, the important part played by congestion and inflammation demands that these lesions occupy our attention first. Congestion is a word often used to imply a minor degree of inflammation. It is at other times, perhaps more properly, restricted to the state of hyperæmia or excess of blood in a part, producing increase of redness. If the hyperæmia be arterial, it is termed active. If the hue be more venous, it is passive. As soon as perversion of secretion or other interference of function, and especially increased cell development, occur, the congestion or hyperæmia has passed into inflammation. A common cold or catarrh may serve as an example, and that kind called influenza is still more typical. The first impression frequently falls on the nose and eyes, very often it commences in the throat. Wherever it begins it displays a tendency to spread. The first indications that the membrane is inflamed arise from the preternatural condition in which it is placed. The afflux of blood is increased, and the nerves are disturbed; tumidity, heat, and dryness, with impairment or loss of function, are thereby occasioned. Hence the prominent symptoms are obstruction of the nose, redness, a feeling of stuffiness, heat, itching, it may be even pain; loss of smell, partial or entire,

&c. The redness, heat, and swelling depend on the congestion, just as in inflammation of other structures. The pain is seldom intense, often only itching, as this tissue is not possessed of the same sensibility as others. Moreover, pressure from within is more easily yielded to than in tougher textures. We never observe that pain which characterises parts highly congested and incapable of much distension, but we often meet with very great swelling. Then the itching or pain is often referred, not to the part irritated, but to its extremity, where the membrane joins the skin; so itching of the nose is an everyday symptom of worms in the intestinal canal.

This state—the dry stage—soon ends in a moist one, when the prominent phenomenon is increased secretion. The debilitated vessels suffer a great deal of fluid to escape, which departs more or less from the normal character of the secretion. We now have a running from the nose of a thin discharge, often so acrid that it excoriates the lip. After a while this becomes thicker, yellowish, or even greenish, and returns gradually to the healthy state. As a rule these stages are to be observed in all inflammations of mucous membrane, which consist essentially of engorgement of the vessels, swelling of the tissues, abundant production of cells, and an increased flow of perverted secretion; the variations which occur depend mostly on incidental circumstances, such as specific cause, constitution of the patient, severity or duration of the complaint, and above all, on the position of the part attacked.

Of such consequence is this last item in reference

to the symptoms set up, the danger impending, and the treatment to be employed, that inflammation of mucous membrane receives different names according to the part attacked. In the lining of the nose it is coryza, or rhinitis, or a cold in the head; in the lining of the fauces it is a sore throat, cynanche, or angina (the Greek and Latin words, *cynanche* and *angina* being used in the same general sense as the English "sore throat"); if it affect the pharynx only it is pharyngitis; if the tonsils, tonsillitis, or cynanche tonsillaris; further down the air-passages, laryngitis, tracheitis, and bronchitis successively.

The frequent origin of the disease in a chill, has given it the popular name of cold, and its prominent symptom, increased secretion, the scientific one of catarrh (*καταῤῥέω*, pour down); and inasmuch as simple congestion or inflammation, however caused, presents the same phenomena, it is not uncommon to designate it as catarrhal, without reference to its cause. It might almost as well be called coryzal, for no doubt coryza is a very ancient word, and originally was used with as much latitude as the English word flux. Coryza is an oriental term, and may be traced in Arabic as well as Hebrew, Chaldee, Syriac, and other tongues from which the Greeks took it. Hippocrates aplied the word *κόρυζα* to any flux from the head, fauces, or chest, but the later Greek writers restricted it to a flow from the nostrils, and used catastagmus (*καταστάγμος*, from *καταστάζω*, I distil) when the throat or chest was affected. The latter word did not survive, but the restriction on the former has been generally adopted. A "cold in the

head" is the popular term for a coryza or rhinitis. A "slight cough" or a "stuffed chest" are terms often used when congestion of the trachea and larger bronchi exist. A more exclusively bronchial congestion is often called only "a cough," or "severe cough," or more properly bronchial catarrh. When the lesser bronchi are involved the term bronchitis is more frequently used. When the local disease is accompanied by fever, the case is often designated febrile catarrh or catarrhal fever, and by the public "a feverish cold" or "feverish cough." Since the great epidemics of influenza it has also become common to speak of catarrhal fever as influenza, and inaccurate as this may be, the word has obtained such a foothold in the language that it is almost hopeless to attempt to displace it, and we are therefore frequently obliged to prefix the term epidemic to distinguish the influenza which should be known by the simple word. Thus we see how so many sore throats, coughs and colds, resolve themselves into congestion, or simple, often called catarrhal, inflammation of some part of the mucous membrane. The term catarrh has also frequently been extended to all simple inflammation of mucous membrane, even that caused by mechanical injury; thus entirely eliminating the idea of its causation by cold, or, as it was termed, catarrh.

The tendency of this lesion to spread has already been alluded to. In influenza this is particularly observed. Commencing in the nose and eyes, it soon involves the throat, and even runs along the Eustachian tubes, giving rise there to distressing singing or noises in the ear or deafness. The soft palate and

tonsils almost invariably suffer. Then it travels down the larynx, trachea, and bronchi, sometimes to their minutest ramifications. And although its chief force is thus expended on the respiratory tract, the digestive canal does not altogether escape. The pharynx is necessarily involved by its position in a disease so inclined to spread over the adjoining structure. From this it may spread along the continuous membrane of the œsophagus, and so find its way to the stomach, the disturbance of which is manifest in the symptoms to which it gives rise. Nevertheless, the violence of influenza is for the most part spent on the respiratory tract.. When it commences in the throat we may watch its extension in both directions, downwards to the lungs and upwards to the nose. Notwithstanding this tendency to spread, we often see inflammation confined to a small portion of mucous membrane.

The throat is the highway to both the lungs and the stomach, its lining forms part of both the respiratory and the alimentary tract taken separately, and on this account is a frequent sufferer. It has been seen to be embraced by influenza, which for the most part exhibits a predilection for the respiratory portion, as do many other diseases, and it is equally obnoxious to affections which have a strong inclination to run along the alimentary canal, leaving the respiratory membrane free, or nearly so. Of these aphtha is a familiar illustration. Usually commencing in and always attacking the mouth, thrush passes along the throat, the common highway to the lungs and stomach, choosing the œsophageal road, and by its

not infrequent appearance at the other end it has given rise to the conjecture that it has travelled the whole length of the tube. Dissection shows, however, that its appearance at both terminations is not a proof of its extending throughout. The extremities are the most sensitive, they more readily take on diseased action than the intermediate portion, and seem to sympathise with each other. Hence we meet the disease in both these situations, where there is strong evidence that its extent is not so great as a careless observer might conjecture. In muguet the coating does not spread to the larynx, but it takes the road of the œsophagus, which tube has been seen completely filled with thrush deposit. It is not seen in the stomach. In those who suffer from this affection, infants, and persons dying of chronic disease, diarrhœa is commonly present, and some have thought it is due to this; others think it only a symptom of the general derangement; certainly any irritant will cause diarrhœa in weak patients, and many suffer from both symptoms. On the other hand, many infants with thrush have no diarrhœa

It is now time to consider inflammation of the mucous membrane confined to the throat. The patient complains of heat and soreness in the part, difficulty or pain in swallowing, and yet he cannot refrain from the attempt, for the unusual fulness imparts a sensation of something to be got rid of by this process. The redness and swelling are very perceptible on looking into the fauces. The uvula is enlarged, its increase of size being most manifest by its elongation, which may be so excessive as to tickle the base

of the tongue, the epiglottis, or even to fall into the larynx. It will thus aggravate the desire to swallow, produce nausea, even vomiting, or give rise to a very annoying cough, or set up paroxysms of spasmodic cough or dyspnœa. The tonsils may be much swollen, their hot, hard, congested state being easily perceptible to the touch. When they are the chief sufferers, the attack is called cynanche tonsillaris. The pillars of the fauces are very prone to attack, and then deglutition is difficult and painful. The lining of the rest of the pharynx in the same way is constantly attacked, and the symptoms vary with the part most affected. Details must be deferred to the chapter on the pharynx. So too, when the larynx is inflamed, according as the changes affect the breathing or voice we have other symptoms which will be referred to in the chapters on the larynx. When the moist stage comes on, the secretion, which is not so abundant as in other parts, is hawked up with pain and difficulty, being rather thick and extremely tenacious. Difficult breathing will be present whenever the swelling or accumulation of secretion impedes the passage of air.

The above form of disease is often brought on by cold, and is that to which the term inflamed sore throat, or catarrhal angina, or cynanche, is most applicable. When it is severe fever is set up, and even in subacute cases there is generally some constitutional disturbance. In connection with the exanthemata, very intense fever is present, and the inflammation extends to the deeper tissues. So when it puts on the worst form, typhoid symptoms supervene, and mortification may ensue, constituting malignant or putrid sore throat.

In healthy constitutions catarrhal or inflamed sore throat rapidly resolves itself, or at most subsides into the chronic state. This, whether coming on gradually, or being the remnant of an acute attack, presents the same symptoms in a less degree, but is more obstinate. Congestion is no longer active; soreness is not intense, often it is not complained of; swallowing may be easy, or only unpleasant; a feeling of dryness or heat is present, and a continual hawking of tenacious phlegm or a tickling cough harasses the patient. The throat is no longer fiery red—often it is pale, but there is evidently a want of tone, the tonsils are perhaps large, the velum low down, the uvula a good deal elongated. The veins are sometimes seen of abnormal size, coursing over the membrane, as in the analogous condition of the conjunctiva called "blood-shot." Such is the state called "relaxed sore throat." The condition of the parts will explain the symptoms; thus, the enlarged tonsils and the swollen pillars are the cause of the obstruction to the food, the elongated uvula tickling the epiglottis, give rise to the cough, the thick and tenacious secretion to the hawking, the combination of these to the desire to swallow, and so on. In other cases more chronic still, instead of increased, we meet with permanently diminished secretion; the membrane seems to be actually dryer than natural, sometimes glistening as if it had been varnished. In these cases there is general atrophy of the tissues. This has been called *pharyngitis sicca.* It might as well be termed dry sore throat. It is very obstinate, though not incurable. When the disease implicates the Eustachian tubes or tympanum, we

have, on the one hand, deafness, on the other, ear-ache. So if the nasal membrane be implicated, obstruction of the nose is produced, or a coryza, according to the prevailing condition, while the intense headache or brow-ache so commonly seen in influenza, is perhaps produced by the extension of the inflammation to the frontal sinus.

The consequences or terminations of inflammation in the throat do not differ from those of the same lesion elsewhere. Chronic induration or thickening is not uncommon in the velum and uvula, and is of great importance in the larynx. Effusion demands attention, for infiltration of the uvula may cause an annoyance, the only difficulty of curing which consists in discovering it; while œdema of the glottis may rapidly suffocate the patient, or necessitate an immediate operation to save life. Abscess is mostly met with in the tonsils, constituting quinsy. Gangrene is to be dreaded in the severer forms, especially in connection with the eruptive fevers. Ulceration is a common consequence when the constitution is originally unsound or has become contaminated; thus in scrofulous, tuberculous, and syphilitic patients it is most common. Erosion is to be distinguished from ulceration by its more superficial extent, but its character is precisely the same. The loss of epithelium caused by the rapid cell proliferation is erosion; when the process extends into the deeper layer of the membrane, causing there also a loss of substance, we have ulceration. If we bear this in mind we shall be able to reconcile some apparently contradictory statements respecting the prevalence of ulceration. In simple

catarrhal cases in sound constitutions ulceration is rare, except at certain spots. In the nose this process is often the cause of obstinate ozæna; in the larynx it is intimately connected with consumption. The term ulcerated sore throat is frequently applied indifferently to all cases in which this process has taken place, although they are so very dissimilar, that it is much better to distinguish them. After a chronic inflammatory state, the mucous follicles are very apt to slowly ulcerate, and disease is sometimes from the first confined to them, the intervening membrane being apparently healthy. In these cases the minute follicles become prominent, red or pale swollen points, which, after a time, ulcerate. This is the "follicular disease" of the late Dr. Horace Green,* of New York, the *angine granuleuse* of French authors, and may be called in English either follicular or granular sore throat; it is often termed clergymen's sore throat, but the name is not a good one, and, like the Latin *vox clericorum*, it is, as shown elsewhere, frequently applied to various forms of sore throat to which clergymen, in common with other public speakers, are liable.

We have seen that inflammation may be confined to a small extent, or involve a large tract of mucous surface. The position and extent of the part inflamed are of the first importance, because on these points hang the diagnosis, prognosis, and treatment. From these circumstances, too, our classifications have been made. Local inflammations of mucous membrane,

* "Diseases of the Air-Passages." New York, 1846; 2nd edition, 1849.

therefore, get names which are intended to signify the entire ailment, or a set of symptoms; thus, as we have seen, the word coryza has become restricted to an inflamed state of the pituitary membrane, which may be a separate attack, or only a part (a symptom, so to say) of a graver ailment. Cynanche, angina, and sore throat are terms applied in the same way. Cynanche is a compound Greek word derived from κύων dog, and αγχω, strangle, because dogs were believed to be subject to the disease. Synanche and parasynanche are forms of the word, also found in Greek authors. Aetius may be cited in favour of our mode of spelling the word, but Cælius Aurelianus and Paulus, following Celsus, wrote synanche. The Latins used angina, from *ango*, throttle, in exactly the same way. Deafness, again, or singing in the ears, tinnitus, may be equally localised disorders or symptoms of more extensive disease. The above complaints evidently depend on the attack involving the lining of the nose, throat, or Eustachian tubes. The pharynx discovers its attacks by pain or difficulty in swallowing, without necessarily affecting respiration, while the larynx and trachea give instant notice of their sufferings by disturbing that function; yet, in these cases, too, it is seldom easy to swallow. If acute inflammation seize the tonsils, deglutition is extremely painful, and sometimes the breathing is considerably affected; yet all symptoms may be sometimes absent when the tonsils are very large and tender.

PHLEGMONOUS OR PARENCHYMATOUS SORE THROAT.

In the several forms of sore throat described in the previous section, the inflammation, though very apt to spread over a large surface, does not display any tendency to extend beneath the mucous membrane. The morbid process is, in fact, chiefly confined to the epithelium, increased action of its cells being the characteristic phenomenon.

When the deeper tissues are inflamed we have phlegmonous or parenchymatous sore throat, which may be either acute or chronic, primary or secondary, and which may be regarded as a much more serious disease, since it often gives rise to considerable destruction of tissue. The danger depends in primary cases on the part affected, for deep inflammation does not often involve a large area, and we shall therefore have occasion to refer to several variations when describing the diseases of different organs. When less limited in extent, but attended by a considerable formation of pus, the phlegmonous form is sometimes called suppurative or purulent sore throat, a term which is also applied to a localised abscess. Extensive deep inflammation may also be caused by injuries such as result when hot water or caustic liquids are swallowed, or irritant vapours or gases inhaled, or foreign bodies get into the passages, or any kind of violence is inflicted on the parts. Such cases are sometimes classed together as traumatic sore throat. Of secondary varieties, the sore throat of scarlet fever is so important as to demand distinct description. In

glanders we see an equally characteristic lesion. Typhous ulceration of the larynx constitutes another more defined variety, and the ravages produced in the throat by cancer, consumption, syphilis, and other diseases naturally involve phlegmonous inflammation; but such cases are properly discussed in separate chapters.

GANGRENOUS SORE THROAT.

May be considered as only a consequence of the phlegmonous form, but inasmuch as mortification sometimes sets in without any previous inflammatory condition being perceptible—as occurs in noma—the claim to separate classification may be admitted.

EXUDATIVE SORE THROAT (CROUP, DIPHTHERIA).

There is a form of inflammation to which the mucous membranes are liable which determines an exudation on the part, sometimes completely clothing it with an adventitious membrane. In the throat this exudation is of infinite importance, forming, as it does, the characteristic feature of croup and diphtheria. The symptoms of this form of inflammation in the throat may not differ *at first* from the more usual variety. For a day or two simple catarrh exists, but soon the alarming nature of the malady is manifested. The danger arises in two directions; first, from narrowing or closure of the glottis; second, from the constitutional condition existing.

The characteristic of this variety of inflammation

is this—instead of a trifling increase and depravation of the secretion in the second stage, a quantity of fibrinous matter is exuded, which rapidly coagulates, and adheres more or less closely to the surface. In the mildest cases it forms flakes, floating in the secretion; in the more severe ones it constitutes a solid, false, membrane, adhering to or lining the part, so that perfect casts of the air-tubes are sometimes expectorated. Thus there is a far greater increase of secretion than in simple catarrhal inflammation, and that secretion departs much further from the normal state. This form of disease may attack any part of the mucous membrane, the position of the part giving it the distinctive features. We occasionally see an inflamed sore throat with a few patches of this kind hanging about the fauces, and giving rise to no general symptoms; but this is a rare circumstance, except during an epidemic, when many such cases arise, and are put down as diphtheria. The presence of the least particle may well excite alarm, for it will rapidly increase and spread in all directions, and soon present a terrible aspect. In children it may run down the larynx and trachea, becoming croup, though this disease more commonly begins lower down. In adults its energy is more often spent on the fauces in the form of diphtheria. This generalisation will be objected to by those who hold that croup is altogether a distinct disease from diphtheria, but the discussions on this question have too often been barren disputes about words: the great fact remains, that both are alike the manifestations of an inflammatory condition tending to exudation. The inflammation may be

either superficial or deep—catarrhal or phlegmonous. Further, it may be admitted that what we call in England croup is rare in France, where diphtheria is so common; and since the latter ailment has been naturalised amongst us it has often presented marked differences from the French form of the disease—it is not unfrequently a kind of croupal diphtheria. Many of the varieties met with in practice seem to be due to differences in the constitution of the patient rather than in the type of the disease. Other modifying circumstances are also constantly brought into operation, of which by far the most important is epidemic influence. In studying the works of Nature we are everywhere met by analogies and similarities, and our clinical observations will become more lucid if we base them on these broad foundations. The most important exudative inflammations of mucous membrane possess properties in common, which are not to be lost sight of in endeavouring to distinguish them from each other. They may occupy any part of the surface, just as a simple inflammation, so that we find the exudation occurring on the pituitary surface, the pharynx, the œsophagus, and even, though very rarely, the stomach, as well as throughout the respiratory tract, More; the conjunctiva is liable to it,* and sometimes it attacks the skin. Why in one case exudation occurs, while in another there is none, is as much one of Nature's secrets, as why one patient is particularly sensitive to catarrh, while similar circumstances in another develope rheumatism.

* Graefe "Archiv. für Ophthal." 1854.

The first appearance of the exudation is not always recognised. A coagulable liquid is effused on the inflamed surface at the commencement of the moist stage. Soon some minute, solidified particles are discerned, and these run into each other as they spread. The exudation may stay here, or another layer may form beneath it, exactly in the same way, and as the false membrane is cast off, the process may be repeated again and again. In other cases the exudation is only partially adherent to the tissue, when blood may be effused and mixed with it, changing its colour; it then rapidly putrefies, and in this state has, no doubt, been mistaken for gangrene.

Much trouble has been taken to elucidate the nature of the exudation. Its toughness, its elasticity, its consistence, its extent, have all been dwelt upon; but these, we have seen, depend on accompanying circumstances. It may occupy a small portion of mucous membrane, and not last long, or it may extend to the minutest bronchial ramifications without varying its nature, and become, as it were, a chronic inflammatory habit. Niemeyer knew a young girl of fifteen years of age who, for several years, daily expectorated a complete cast of the left bronchial tree. Usually, moreover, it is tougher and denser in the larger tubes, and more fluid in the small ones. Here it covers the epiglottis like a glove, or casts of the tubes are coughed up. There it scarcely coagulates. On separating a tough and adherent specimen, its under surface is seen to be studded with red points and streaks, which correspond to similar bleeding spots on the mucous membrane, and through these the con-

nection of the two seems to be maintained. On placing a portion in water it is seen to float, and does not dissolve. Alkalies disorganise and partially dissolve it, as do some organic acids, as lactic. Pepsin and papayin also act upon it. Nitrate of silver and the mineral acids curl it up and harden it. Under the microscope this substance sometimes looks like a fibrinous network, of an irregular pattern, containing in its meshes leucocytes and epithelial cells, as well as the *débris* of the tissues. In other cases it is so disorganised that scarcely anything can be made out. Again, it seems at times to be composed entirely of cast-off epithelium cells. This seems to point to the true pathology of the disease ; just as catarrhal inflammation consists of an excessive cell production, with active but purulent secretion, so exudative inflammation in its turn seems to be a still more active disease of epithelium, in which the cell formation is even more excessive. This view, however, is in opposition to that of some able authorities.

It is customary with many to speak of every exudation as diphtherial, but this loose mode of using words is hardly justifiable in so momentous a case; at any rate, it is best explained. A good deal of space is occupied in the present volume in insisting upon the analogies and resemblances of diseases ; but the author has no wish, therefore, to confound all similarities with identities. Extremes are to be avoided, and care should be taken, while bringing one portion of a picture into full relief, not to throw another equally important too far into the shade.

Exudation takes place in other states than those

mentioned. It is a common symptom of phlegmonous or deep inflammation of the throat. It is almost always present in that rare disease, acute glossitis. It is not at all uncommon in measles. It is this process which causes the sloughs of malignant scarlet fever and of putrid sore throat, and extending into the nares it is the malignant coryza of that exanthem. In the same disease it may extend to the mouth and lips, but does not often attack the larynx. It is also seen in septicæmia and the later stages of continued fevers. It also appears in other conjunctions, especially during an epidemic. Thus a larger class of ailments are brought a link nearer each other by exceptional cases.

FUNGOUS SORE THROAT.

Instead of an exudation from, we may have a deposit upon, the mucous membrane. This is the case in thrush, or muguet, which attacks infants in the first weeks of life, and patients who are dying from exhausting diseases. The deposit is due to a vegetable parasite, the presence of which can be readily proved by the microscope.

In muguet, the exudative stomatitis of children, a cryptogamic vegetation called *oïdium albicans*, is invariably found. It was first discovered by M. Berg, of Stockholm, whose observation has been abundantly corroborated since then by M. Robin, who has very carefully investigated the production of vegetations on mucous surfaces.* Where a vegetation is traced

* "Histoire Naturelle des Végétaux Parasites," &c. Paris.

it may admit of doubt whether it is the essential part of the disease, or whether an exudation, otherwise determined, may not prove a favourable nidus for its development; and it is possible some truth may pertain to each of these views. In respect to muguet, or millet, the *oïdium albicans* is constantly present, and the pellicle formed on the mucous surface is almost entirely composed of its sporules. This disease is infectious, is frequently communicated by children using the same cups and spoons; it has been successfully inoculated.

CYNANCHE PAROTIDEA.

As the mucous membrane extends continuously along the ducts into the interior of the perfect glands, it is not surprising that the inflammatory process should sometimes spread in this direction. Indeed one might anticipate such a result of catarrh to be more frequent than we actually find it. Arising in this as well as in other ways, we, however, meet with inflammation, not only of the glandules of the throat and mouth, but of the salivary glands themselves. These are also obnoxious to other influences—*e.g.*, their secretion may be changed, and a thick, vitiated, or cheesy, or creamy fluid may be exuded; the ducts may become obstructed, giving rise to abscess resulting in fistula; concretions may separate out, forming salivary calculi, and other conditions in the neighbourhood may call for careful investigation.

When inflammation attacks the glands, swelling and pain are the prominent symptoms. Suppuration

is rare, though inflammation of the tissue around the gland is common, and frequently results in suppuration. Metastasis is common in mumps, or cynanche parotidea, or parotitis. The parotid, being the largest and most important of the salivary glands, is more often attacked than its fellows.

In connection with the subject of metastasis, it may be proper to allude to a somewhat analogous sympathy between the tonsils and the ovaries, first pointed out by the author in the *Medical Times and Gazette* for September, 1859, since when he has met with numerous cases, some of which have been published. As the tonsils will again come under notice, the subject is only mentioned here for the sake of showing what mysterious relations subsist between diseases which, in other particulars, seem far removed from each other.

NON-CONGESTIVE SORE THROAT.

We have now passed in rapid review the majority of the ordinary forms of sore throat. It will have been observed that they are all accompanied by congestion or inflammation, and many of them are only manifestations of this process. They may be grouped together as sore throat, in which there is disturbance of circulation leading to excess of blood in the part affected. This local engorgement, or hyperæmia, as it is also called, leads to some other results: one example of these may be named—hæmorrhage, though bleeding may occur without hyperæmia, and where

we have spitting of blood, it becomes necessary to determine not only its origin, but the part from which the hæmorrhage takes place; for such an occurrence may be the result of a slight local ailment, or the effect of serious disease either in the throat or lungs, or it may be the expression of a constitutional malady, such as purpura or consumption.

There is another condition, the exact opposite of engorgement or hyperæmia, that is anæmia, or as it might more correctly be termed, hypoæmia. In this we have decrease of blood manifested to the eye by pallor instead of redness. This is sometimes a most significant symptom, for it may give warning of the approach of consumption, or it may be only a local sign of a general anæmic condition. If local anæmia be extreme, it leads to death of the tissues.

In another series of cases the prominent change is in the function of nutrition. Here, too, increase or diminution may either of them occur, constituting hypertrophy and atrophy, while perversion of nutrition gives rise to the several degenerations. Neoplasms, or new growths, take their place as forms of hypertrophy. Complete arrest of nutrition gives rise to death—necrosis, or gangrene.

Again, changes affecting the motor function, whether depending on local or distant disease may derange the movements of the parts. Here, excess of movement takes the form of spasm; impairment or loss of motor power, is paresis or paralysis. As the muscles are governed by their nerve supply, so their power of movement may be affected either by disease in their own tissues; or in the nerves. either at the

periphery, or in any part of their course; or again, the central nervous system may be at fault. The desirability of distinguishing such derangements must be obvious.

Not only motor but sensory nerves, or the parts they supply, may give rise to increase, decrease, or perversion of sensation, when we have hyperæsthesia and neuralgia, anæsthesia or paræsthesia.

So, too, there are cases connected with the general condition of the nervous system in which little, if any, perceptible changes in function may be demonstrated, or, on the other hand, in which functional derangement is very evident. To all these the rather indefinite term of "nervous sore throat" is not unfrequently applied. It is well to restrict as much as possible the use of such a phrase, which is apt to lead to diminished ardour in the endeavour to trace out the nature of the case.

Lastly, besides the traumatic sore throat to which allusion has been made, the presence of foreign bodies in the parts may have to be recognised. Such bodies may obtain access by accident or intentionally. They are often drawn into the air tubes by the breath, and children are apt to put all sorts of small things into their ears and noses. Then insects and parasites of a minute kind, both vegetable and animal, may effect a lodgment in any of the parts we have named. The consequences will depend much on the part the foreign bodies occupy.

It will be seen that many of the disorders we have hitherto been considering may arise from influences acting on the parts involved, or operating indirectly.

It must be added, that we may have another set of local causes which act primarily on neighbouring parts—for instance, tumours, from the pressure they exercise, often affect the throat. It is in this way that bronchocele or goître, glandular or other enlargements, become of importance, and some of them thus maintain their claim to the name external sore throat. Further, in consequence of the nerve supply of the larynx, it is common for thoracic tumours, including aneurism, to produce early symptons in that organ.

As the processes with which we have been dealing may affect the several organs composing or connected with the throat, further remarks about them are deferred to the second part of this work, in which the diseases of each of these organs will be dealt with in detail.

SPECIFIC SORE THROAT.

The course of sore throat is greatly influenced by the cause which gives rise to it. The affections consequent on the inoculation of animal poisons are vivid illustrations of this. Glanders may be mentioned as such a poison. Besides, we have also to consider how far an ordinary inflammatory condition precedes, accompanies, or predisposes to certain constitutional varieties. Both tubercular and cancerous diseases of the throat necessitate a degree of inflammation, widely as they differ from it in other respects. The local ailment—the "sore throat," of which the patient complains most, and sometimes exclusively, reveals to the

physician the existence of a grave constitutional disease. All constitutional states may interfere with the course of the local manifestation. That specific sore throat which arises from absorption of the venereal virus presents such various appearances, that, to avoid mistakes, it is needful to be always on the alert. It may give rise, in its early stages, to excoriation, erosion, or even to mere congestion of the fauces. The parts look red and raw, and perhaps are also swollen. These qualities may be obscured by a dirty white secretion, but are seen on gently wiping it off, or a thickening of epithelium may in like manner disguise the real appearance. Slight soreness, with or without swelling, will then, in certain cases, excite suspicion. A worse form of syphilitic sore throat begins as papules, patches, or gummata, and terminates in foul, deep, indolent ulcers. These may not cause much suffering; in fact, no inconvenience may be felt, or only a change of voice, noises in the ears, or constant hawking, when inspection reveals a formidable loss of tissue. The history is extremely important in clearing up the diagnosis, but it is often impossible to obtain a correct one. A much more dangerous variety is the sloughing ulcer. It may begin as a mere aphthous speck, but soon displays its formidable character. The sloughing may implicate the carotid artery, and so end in sudden death.

The tonsils are the most constant seat of specific sore throat. The soft palate frequently suffers; then the palate and nose. The larynx is liable to become ulcerated, and sometimes the disease of this organ puts a period to the patient's career.

EXANTHEMATOUS SORE THROAT.

A form of sore throat apparently originating in an animal poison, is that met with in the eruptive fevers. It is common to the whole class, but more frequent and severe in one variety than another. It constitutes the principal lesion of scarlet fever, and most practitioners have met with it in measles and small-pox. This specific inflammation of the fauces is of the gravest kind, very often proving fatal. Occasionally the rash may be watched extending itself to the mucous membrane, and giving rise to its disease. Probably this happens more frequently than is imagined. At any rate, this sequence of events may teach us that appearances very unlike each other may be identical in nature, modified only by the tissues in which they are situated. The disease often first shows itself in the mucous membrane. Inflamed sore throat and smart pyrexia are the prominent facts. In the early stage, little else may be observed. The fauces are red and swollen, perhaps, but not necessarily painful. In more severe cases the inflammation is deeper. Then exudation may occur, succeeded by ulceration and sloughing. Between the mildest and most malignant forms every variety presents itself. The tonsils—always great sufferers—sometimes bear the whole brunt of the disease ; and then may be so swollen and tender that swallowing is impossible, fluids are returned through the nose, and even the passage of air into the lungs is impeded. The larynx is not often seriously implicated in scarlatina, but in

measles the whole respiratory mucous tract is attacked by catarrhal and sometimes by exudative inflammation. When any disposition to the formation of false membrane co-exists, the air-tube is more liable to suffer.

Epidemics of the eruptive fevers differ very greatly, and it becomes the physician to make himself acquainted with the prevailing type, as well as to be on the watch for any change. In some epidemics a rapid recovery is the rule, in others convalescence is unusually protracted, in a third class the mortality is far more fearful. So much is this the case, that a confident and hopeful prognosis may be justifiable in one, while in another the gloomiest forebodings must be expressed. The appearance of the eruption is as various as that of the angina. Sometimes we have the sore throat without the eruption—a form, when well marked, I have been in the habit of calling cynanche exanthematosa, and of which I have studied several epidemics. Dr. R. Williams described such cases occurring in epidemics of scarlet fever as *scarlatina sine eruptione.** Further, some degree of uncertainty may be occasioned by the rashes sometimes appearing to mingle with each other. This is especially the case with scarlet fever and measles, between which, in their typical forms are several links, in which the rashes partake somewhat of each other's characteristics, so that one physician might designate measles what another called scarlet fever, and yet the one would have as good reasons as the other for his classification. The two diseases were not differentiated

* "On Morbid Poisons."

until the beginning of the nineteenth century, though typical cases of each are very distinct. Perhaps, after all, there may be fewer fever poisons than has been conjectured. Is it possible that these exanthemata, so near to each other, are in essence but one, modified by the conditions under which it is developed?

The above description best fits the sore throat of measles and scarlatina, but a similar angina is liable to occur in every eruptive fever. In small-pox, pustules exactly similar to those on the skin attack the mucous membrane, and when they appear in the larynx may set up œdema glottidis. In erysipelas, too, infiltration of the sub-mucous tissue occurs. Nor are the exanthems the only pyrexiæ in which this occurs.

HERPETIC SORE THROAT.

This brings us again on the interesting relation which subsists between the skin and the mucous membrane. The structure and function of these tissues being so like, we might anticipate some similarity in their diseases, and the author has traced this in many instances. A chill, a suppressed perspiration, any interference with the cutaneous function, is an everyday cause of bronchitis, cynanche, or some other catarrh of the mucous membrane. A hundred instances will occur to the reader. Such things have been put down as sympathy. It is more probable that these similarities depend on textural likeness.

The analogy between the skin and mucous mem-

brane extends much further. The superficial or catarrhal inflammation we have described in mucous membrane has its counterpart in the skin in that troublesome disease called eczema. This catarrh of the skin is a superficial diffuse dermatitis, which exhibits a tendency to spread as marked as the inflammations we have had to consider, and is provoked on the skin almost as easily as they are on the mucous surface. There is increased cell development, and more or less abundant transudation of fluid, the degree of this and the changes it undergoes accounting for many of the varieties in the appearance of the eruption.

Let us compare some other affections of the skin and mucous membrane. One example, herpes, so familiar on the skin, is often mistaken on mucous membrane. Herpes preputialis ought to be known to every surgeon, or he will sometimes do his patient grievous injustice. It may present some difficulty, but more blunders happen from forgetting its possible existence than from the absence of indications for diagnosis. This case is introduced because it is parallel to a form of sore throat—herpetic cynanche, I call it—which is sometimes very troublesome. Everyone is acquainted with herpes labialis. Well, this often spreads to the mouth and throat, and what is of more consequence, it may commence in the latter and not extend beyond it. It comes on with some severity, so far as the patient's sensations are concerned, and in weakly people, sets up a degree of feverishness. A careful inspection discovers the vesicles situated on red patches. A little later their contents are opaque, so

that they are more easily discerned, but they are very often broken in their early stage by the passage of food, leaving small deep ulcers. If any escape, they burst about the fourth day, and give rise to the same ulceration, which is very irritable. French authors attach peculiar importance to the herpetic diathesis, and see herpetism where others fail to trace it. Many of them include under this name ulcerations which in this work are otherwise classified. It is important to distinguish this herpetic sore throat, because nitrate of silver, or any caustic, will be sure to aggravate it. The co-existence of herpes on the lips is an aid to diagnosis. The preputial form may be cured in a few days by bits of cotton-wool, to absorb the secretion and keep the part dry. Herpes on mucous membrane produces small ulcers, and the chief obstacle to their cure is the moisture; all irritants, too, make them spread with great pain. The different appearances given to this ailment by the conditions in which it is placed—on the dry, external skin, or the moist, internal lining—is a great encouragement to pursue inquiry in this direction.

Pemphigus, or vesicular fever, as it is often called shows us similar appearances on the skin and mucous membrane, and often extends to a large surface of each. After all, can we point out much difference between herpes and pemphigus, except in severity or intensity? The remarks I made on pemphigus in my first edition have since been confirmed by Barensprüng.

Psoriasis may be seen in the throat, accompanying its appearance on the skin, and in the absence of

the cutaneous disease a similar process may some times appear on the mucous membrane.

Cutaneous hæmorrhages have also their counterpart in the mucous membrane. We might, indeed, anticipate that the more vascular tissue would be most obnoxious to these affections, and such, I believe, is really the case. Purpura constantly affects the fauces. It also gives rise to epistaxis and hæmorrhage from any of the mucous membranes. In one fever we see petechiæ on the skin; in another, a similar affection of the mucous membrane. Is not scurvy an additional example? Cejka saw cases of scurvy which began in the gums, these being very sore for some time before general symptoms set in. Scurvy is less liable to set up mucous hæmorrhage than purpura.

Pellagra, the scourge of the Italian peasantry is another example. Though at first the chief development of this disease is on the skin, it soon implicates the mucous membrane of the lips, mouth, fauces, and alimentary canal. The vascular and nervous systems are affected later. Exhausting diarrhœa destroys many and intercurrent disease of the lungs carries off about half. Pellagra lasts for years, but sometimes is acute and assumes a typhoid form (tifo-pellagroso) which is usually fatal.

Another class of skin disease. Acne and sycosis consist in follicular suppuration, and so are intimately associated with an affection of mucous membrane before described. Barensprüng classes these diseases together now. Need the reader be asked whether he has ever seen a stye?

Another class—does not pruritus torment both

structures alike? How often, too, is nettle-rash associated with irritation of the lining of the stomach? Can a similar condition exist in the two parts?

Lastly, to complete our analogy, either tissue may become the seat, not only of the various forms of inflammation we have considered, but of such morbid processes as we see in scrofula, tubercle, cancer, and lupus. The last disease is here of special interest, as a neoplasm which particularly affects the skin, and the mucous membrane of the nose, mouth, and throat.

CHAPTER II.

DIAGNOSIS OF SORE THROAT.

IN every case brought under his notice, the physician's first care is to get a definite notion of its nature. The means of investigation at our disposal are the same as in all the natural sciences—the five senses, assisted by every device which can be of service. These it is our business to educate; not this nor that, but all, so that one may check another, and that we may pass judgment on the whole evidence we can elicit. We are able, too, to call in other witnesses, though these are much less trustworthy. The senses of the patient, and of those about him, will give their testimony. The history will, of course depend on these alone. By them, too, we often complete what would otherwise be fragmentary, and are able to draw distinctions and indications which we otherwise could not. They are therefore essential links in the chain of evidence. It is from others we obtain information about the patient before we see him. In this we must get a statement of facts, and not opinions. The notions of the friends are not only crude, but very often mere suppositions, or fears with-

out foundation in fact, and these ought never to influence the judgment. Well-attested facts are of the utmost value, but in eliciting them it is requisite to avoid all leading questions, discard all theories, and if possible, conceal from the witness the exact bearing of his communication. For this purpose, some adopt the plan of making the patient, or a friend, or both, relate the history without any interruption, and of questioning them afterwards with a view of settling points left doubtful, or filling up gaps in the narrative.

Passing to the evidence of our own senses, let us first consider the general impression made upon us. and then separate this into its component parts. In this general impression, produced as we enter the sick room, or as the patient walks into our consulting room, sight is not the only sense employed. It is true we see much, but we hear too—the breathing and voice, for instance. Sight, too, gives a notion of feeling, to be corroborated or corrected by actual touch. Smell must always be included, and this cannot but convey an idea of taste. It is clear, therefore, that a general impression may be conveyed to the mind as soon as the patient comes within the range of the senses. Much might be learned by prolonging this stage of the investigation. Before a word was spoken I have sometimes pointed out to medical friends the nature of a case, which vigorous scrutiny corroborated. Not that such a diagnosis ought to be acted on. It merely shows how much may thus be learned. Posture, gait, aspect, expression, colour, excitability, flushes, emaciation, manner of breathing, voice, phy-

siognomy, and the many other points which may thus be studied, should all have a place in the physician's memory, for all are in turn to be more closely questioned. To gain all this information so quietly and unostentatiously is, to my thinking, the surest and best way. Standing thus at the bedside of difficult and dangerous cases, in silent contemplation of the phenomena presented, we may often gain a more accurate general impression, correct the errors of a momentary interview, analyse and compare our observations, and so get a more perfect portrait of the disease. The reader who tries the experiment will be surprised to find how much can be learned by this systematic analysis of the various points which make up the physiognomy of disease. Having exhausted this source of knowledge, we may fairly draw from others, and now accordingly we turn to the individual senses.

Smell is the sense which is perhaps least cultivated. The indications it affords are important, if few. An unpleasant odour may proceed from various causes. Perhaps most frequently it occurs from diseases in some part of the nasal passages, producing offensive discharges, which have been lumped together under the term ozæna. In this case it is necessary to proceed to a rhinoscopic examination in order to determine the cause of the discharge. But unpleasant smells occur from other causes, for example, from offensive discharges in the follicles of the pharynx or the tonsils, and again from foul ulcers in any part, or even from decayed teeth.

Hearing is often called into use, both as to voice

and breath. Harsh, loud, or obstructed breathing; cough, whether dry, moist, barking, spasmodic, or whatever the quality; hoarseness, diminution or loss of voice, or change in its *timbre*, or want of purity in its tone, as well as imperfection of speech of any kind, at once excite attention and demand an explanation. The morbid states of the throat and chest are so intimately connected, that it is absolutely necessary to train the ear to a skilful use of the stethoscope. Often, indeed, throat cases entirely turn on the results obtained by this invaluable instrument.

Feeling tells of sensations, both of the observer and observed. Thus, by touch we ascertain the presence of tenderness, hardness and softness, roughness and smoothness. To touch in connection with sight belong increase and diminution of size. To touch and hearing combined belong the phenomena of percussion. Palpation of the throat often reveals the presence of unsuspected symptoms, and the physician should endeavour to gain from it the largest amount of information with the least possible pain or inconvenience. Enlargements of various kinds about the neck and throat are subject to careful examination by the sense of touch, which may also be applied within the mouth, throat, and posterior nares. The pharynx is thus within the reach of this sense, both externally and internally, and one finger can be within, while the other hand follows the movements from the exterior. The finger passed behind the velum may be also turned upwards, and thus we may rapidly explore the upper part of the pharynx as far as the posterior nares, satisfying ourselves as to the condition

of the vault, the velum at the posterior part, the septum, the orifices of the Eustachian tubes, the fossa of Rosenmüller—in fact, of all this important region that can be touched. Parts inaccessible to the finger, can be reached with a sound, of which I have had various forms constructed, but of course they are not so useful as the finger itself, but in using sounds we have the advantage of the sense of sight at the same time. Examination of the larynx externally by careful palpation is often most useful. We are, too, sometimes driven to introduce one finger internally, for an instant, especially in young children. It seems almost unnecessary to insist upon the need of gentleness in these explorations, but usually so little is learned by inefficient action, or else so much unnecessary pain is given, that I would strongly urge the avoidance of anything like violence.

Sight is the most important sense of all. The proverb says, "seeing is believing," and pretty generally this is so. In all cases of sore throat inspection is to be had recourse to. It is often so carelessly done that nothing is gained by it. To see the parts well the tongue must lie flat on the floor of the mouth; so that if involuntarily arched or unusually thick it should be pressed down and drawn rather forwards. A spoon—so often employed—is not well adapted for the purpose; if the bowl be placed in the mouth it hides the fauces as effectually as the tongue itself, frequently more so, for many patients can display the throat very completely; if the handle be used, its sharp edges are apt to give pain. The common pocket tongue-depressors are

useful, but their shape is not well adapted for more than cursory examinations, and for these a paper-knife is usually handy. My simplest tongue-depressor, designed before the discovery of the laryngoscope, and in constant use ever since, is of such a shape (as seen in the annexed engraving), that when introduced the base of the tongue is easily controlled by the broadest part of the blade. A second blade of a smaller size is required for children; both screw into an ebony handle, and are thus very portable.

FIG. I.

For operative purposes the instrument depicted in the next engraving will be found most valuable. It is based upon Türck's, which I have so modified as to

make it much more generally useful. I have the hooked handle made much more slender than usual, and the blade fitted with a circular shoulder instead of a square one. My instrument can therefore be fixed in any position by a mere turn of the screw The figure shows my depressor with three blades, but of course additional ones may be had if required.

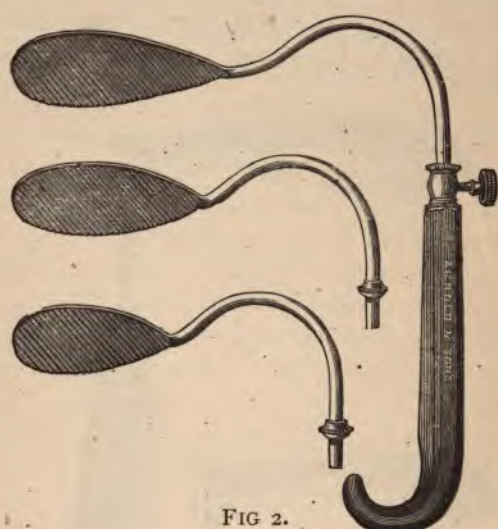

FIG 2.

Another instrument, which I had constructed in the pre-laryngoscopic era, is a throat speculum of suitable size to be introduced into the mouth. It may be made of glass covered with caoutchouc, or of metal. The shape may be simply oval, or the under portion may be curved somewhat like the under-blade of my tongue depressor, or it may be bivalvular. This

speculum is not only useful for inspection, but is often of service in localising topical applications in children and timid patients. It holds down the tongue and conducts the light to the point desired. In order to use it without interfering with the light, I had a number of instruments made, bent at a right angle. Having always used these, it was natural perhaps that I should on the discovery of the laryngoscope adopt the same angle rather than the continental curve.

In conjunction with my speculum I have long employed a condensing lens or a concave mirror to illuminate the throat. The earliest concave mirror I employed was an old-fashioned traveller's shaving glass. Before then I had tried other methods of illuminating the fauces, one of these being to place the patient so that the stream of light from a large globe of water (such as seen in chemists' windows) might fall into the fauces; another, to use a convex or plano-convex lens, such as the microscope condenser. The concave reflector is by far the most convenient, and may be used in any position. The patient may be standing up or sitting down, or lying in bed, and yet a good view may be obtained either by daylight or with a lamp, or even a candle. The reflector used in laryngoscopy answers the purpose.

The parts visible on inspection have already been mentioned, It remains only to add that from this source of information we learn what deviations from the normal state have taken place. These may be changes in form, colour, or function. As to form

we have increase or decrease of size, new formations, and other abnormalities. The colour in the same way may be heightened, as in hyperæmia, or the reverse condition may exist, or pigmentation may have taken place · As to function, the secretions may be changed in quantity or quality; or the innervation may be at fault, so that we have motor derangement, spasm, or paralysis. The humidity and the lustre of the membrane, the presence or absence of erosion or ulceration, malformations, old cicatrices, and in fact any deviation from the healthy standard in the surface brought into view, can thus be studied. One caution may not be deemed amiss. The standard of health should be carefully sought by examination in the living body, and for this, all opportunities should be seized by the inexperienced. There will then be fewer instances of healthy throats being cauterised through mistaking, for proofs of disease, appearances which are not incompatible with a normal condition of the parts.

So much can be seen by ordinary inspection through the open mouth; but of late years we have made great advances by the simple expedient of holding in the back of the throat a small mirror, upon which light is directed in such a way that we are able to observe the image of any parts reflected on its surface. This constitutes the art of

LARYNGOSCOPY AND RHINOSCOPY.

Just as we have taken the word pharynx for a *single* organ, although once it had a wider significa-

tion, so, anatomically, the word larynx is used for the organ of voice. The original λάρυγξ, doubtless more nearly means throat, but was also often used with special reference to the part to which we apply it, as is clear from the verb derived from it being used for scream, cry out, or shout. Larynx, then, with the assistance of the usual σκοπέω, enables us to name our apparatus laryngoscope. But when we proceed in a similar manner to explore the posterior nares we call this plan rhinoscopy, from the Greek for nose, ῥίς, genitive, ῥίνος, or from the later nominative ῥίν, and σκοπέω. When we employ the apparatus on our own persons the possessive pronoun, αὐτός, self, enables us to distinguish the process as auto-laryngoscopy or auto-rhinoscopy. The word pharyngoscope, it is obvious may be used in a similar way, but it has also been applied to the examination of the pharynx by reflected light without a mirror being introduced into the fauces. In the latter case, however brilliant the light, of course only that part of the pharynx can be seen which is visible on ordinary inspection as already described.

To obtain a view of the interior of the larynx, we have only to hold in the fauces at a proper angle a small plane mirror, and illuminate it in such a way that we can see the parts reflected in it. In fact, we have only to look round a corner by means of a looking-glass, a riddle which like all others, is easy enough when the solution is known. No doubt many have endeavoured to see these parts without success. Indeed, since the laryngoscope was perfected, numerous hints have been collected from previous authors who were near the

discovery. Some failed from one cause, some from another. Some could not get sufficient light. Some forgot to warm the faucial mirror, and so it was at once obscured by the breath condensing upon it. I related in the first edition of this work how I had myself succeeded in detecting and curing disease by the aid of reflected light, and thus in reality applied the principle of the laryngoscope before the date of that invention. The case referred to, was treated in 1856.

FIG. 3.

But the rude instruments constructed for the purpose were laid aside without any effort to improve them, or any thought of making them of daily service, and yet a few years afterwards laryngoscopy was a recognised *art.* This case demonstrates that I was the first to

employ reflected light to apply topical remedies. But it is unnecessary to refer further to the history of laryngoscopy, as I have elsewhere* treated it at length, and now pass on to the use of the instrument.

The preceding engraving, Fig. 3, represents the simplest method of laryngoscopy by reflected artificial light, and has been copied from a photograph taken for me many years ago.

It will be seen that the light from the lamp falls on the concave mirror beside or through an aperture in which the observer looks. From this it can be directed wherever it is desired. The patient opens the mouth, the tongue is protruded and steadied by the thumb and forefinger covered with a small napkin, the rays are brought to a focus in the fauces, the laryngeal mirror is warmed, and at once placed in position, when on its surface there will appear an image of the parts. A very simple diagram will show

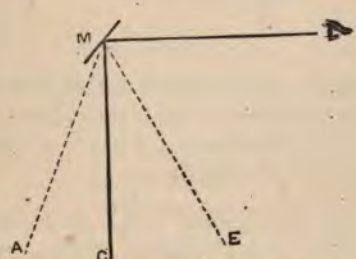

FIG. 4.

how this occurs. A ray of light from the reflector

* "Laryngoscopy and Rhinoscopy in Diseases of the Throat and Nose." 4th edition.

through which the observer looks falling upon the mirror M is reflected to the glottis G, of which an image appears at M. Obviously a very slight inclination of the mirror may throw the light along either of the dotted lines, in which case the image of G will be replaced by another, A or E, as the case may be. If the mirror be turned in the right direction, we may see the posterior nares instead of the larynx.

The next engraving, which represents a section of

FIG. 5.

Section of parts with mirror held as in auto-laryngoscopy. 1 to 6, the cervical vertebræ; *u*, uvula; *L*, larynx; *e*, epiglottis; *tr*, trachea; *h*, hyoid bone; *t*, tongue; *J*, (lower) jaw; *m*, (upper) maxilla; *k*, laryngoscope.

the parts with the mirror held as in auto-laryngoscopy, may render the subject a little clearer. The laryngoscope being held *in situ*, a ray of light represented as a straight line (*a*), is seen to fall upon it, and be reflected behind the epiglottis (*e*), and so down the larynx (*L*), impinging on the wall of the trachea (*tr*), when an image appears in the faucial mirror (*k*).

Of course there are various difficulties and obstacles to overcome, but these must not detain us. For detailed instruction how to deal with them the reader is referred to the author's "Laryngoscopy and Rhinoscopy," in which he will find instruction on these and other points, together with a description of the forms and uses of the instruments employed in connection with the laryngoscope.

We pass, then, to a consideration of the laryngeal image as brought into view in the living body. If the mirror be properly held, with the full light directed upon it, and the conformation of the parts be normal, an image of the interior of the larynx appears on its surface, the vocal cords arresting attention by their movement, as well as by their white colour, which is in striking contrast with the red of the surrounding parts. The positions and relations of all the parts likely to come into view in the attempt to see the interior of the larynx may be studied in the following illustration, fig 6.

The laryngeal image, as seen in a moderate-sized mirror, is included in the dotted circle. This engraving is copied from Türck,* with the exception of the dotted circle, which was added by Dr. T. J. Walker.† Several parts, such as the base of the tongue, will at once be recognised. The letter *g* points to one of the true vocal cords, while *h* indicates one of the so-called false cords; *i* is the rima glottidis, or opening between the true cords; *e* the arytænoid cartilage surmounted

* "Klinik der Krankheiten des Kehlkopfes." Wien. 1866.

† "The Laryngoscope in its Clinical Applications."

by the capitulum Santorini, and close to this is the cartilage of Wrisberg, *f*. The epiglottis is marked *a á*, the glosso-epiglottic ligament *b*, and the vallecula *c*. The figure gives a fair idea of the relative position of the parts.

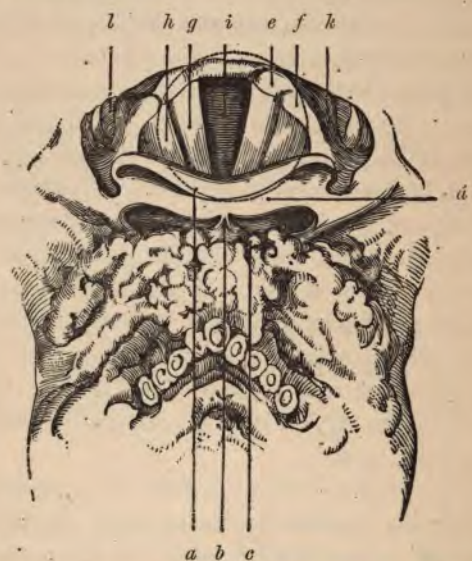

FIG. 6—Base of tongue and larynx. *á á*. Epiglottis ; *a*. Its lip ; *á*. Its anterior surface ; *b*. Glosso-epiglottic ligament ; *c*. Vallecula ; *e*. Arytænoid cartilage surmounted by the cartilage of Santorini ; *f*. Cartilage of Wrisberg ; *g*. True vocal cord ; *h*. False vocal cord ; *i*. Rima glottidis ; *k*. Outer surface of arytæno-epiglottic folds ; *l*. Inner surface of wall of pharynx.

By holding the page horizontally, it will be noticed that the tongue is the nearest the observer, the epiglottis comes next, and behind it is the glottis.

This is the position of the parts as they actually exist in a patient seated in front of the observer, but in the laryngeal mirror the position of the parts is reversed —the nearest becoming the most distant. The last engraving should, therefore be compared with the following smaller cut, fig. 7, which represents the same parts except the base of the tongue, which it is not necessary to re-engrave. Here we have the position of the parts as they appear in the laryngoscope, and as they are represented in the coloured illustrations of this volume. The lettering corresponds with that of the previous engraving.

FIG. 7.

There is no such thing as a lateral inversion of the image in the laryngeal mirror. The idea can only result from a confusion of terms. Right and left are words that each speaker is apt to refer to himself as a standard, but almost every clinical clerk is aware of the necessity of discriminating between the right or left side of the patient and himself. Rather ludicrous mistakes do, however, occur. For example, I have seen a gentleman listening on the right side of a patient's chest for the sounds of the heart. The same confusion lurks in the error about lateral inversion

in laryngoscopy. The physician sits opposite the patient, and looks at the image formed in the mirror held in the fauces. The right hand of the physician is therefore immediately opposite to the left hand of the patient. It is the same with every other part. The standard of right or left must therefore be referred to the patient, and then it will be manifest that as the left vocal cord of the patient is opposite the right of the physician, so it appears on what the observer calls the right side of the mirror, but what would be called by the patient its left side. The correctness of the foregoing statement respecting inversion admits of the easiest experimental proof at the hand of every reader. Standing in front of a swing toilet mirror, the upper part of which is inclined forwards, so as to represent the position of the laryngoscope in a patient's fauces, he has only to place this book on the stand, and examine the image of any of the figures as reflected in the glass. He will thus satisfy himself of the accuracy of what I have said. Nor is it necessary for the experiment to turn to the figures, though as they represent the parts to be seen they are more striking. The letters on any page are reflected in exactly the same way. They appear in the glass upside down, but they do not read from right to left. There is no lateral inversion.

The laryngoscope enables us to look into the living larynx and watch its many movements. Accordingly the image at which we gaze in the mirror, differs considerably from anything met with in our anatomical studies. It is therefore desirable to describe a little more fully the parts of this image,

and the variations in the appearances which may be observed in the healthy human larynx. The epiglottis occupies the highest part of the laryngeal image. Its shape varies much in different individuals, as may be seen in the figures on plate II., figs. 1, 2, 3, but such varieties of conformation must not be confounded with changes caused by disease. The free border of the epiglottis may be watched alternately rising and falling during the examination. The attached border is connected to the receding angle between the two alæ of the thyroid cartilage by a long narrow band, the *thyro-epiglottic* ligament, and a similar band, the *hyo-epiglottic* ligament, connects it with the posterior surface of the body of the hyoid bone. The *lingual, upper, or anterior surface* of the epiglottis, usually curves forwards towards the tongue, and the mucous membrane by which it is covered forms a median and two lateral folds, called *glosso-epiglottidean* ligaments. The *posterior* or *inferior* or *laryngeal* surface curves in a reverse way. It is usually convex from above downwards, and concave from side to side. To the sides are attached the *glosso-epiglottidean* folds or ligaments. Thus the epiglottis necessarily is not all visible at once. In most cases a part of the upper surface comes into view on each side, presenting almost a scroll-like form, and in the middle we see the under surface turned up like a lip. Below and behind this another portion seems to bulge out, and has been distinguished as the cushion, pl. II., figs. 2, 4. The upper surface is of an obscure pinkish colour. The lip looks like what it is, yellow cartilage with a vascular mucous

membrane clothing, and giving it a tinge of pink or red. The cushion is much brighter. Further, when we see the whole of the laryngeal surface of the epiglottis at once, the colour is more distinct, and this hue has been taken for congestion. If only the edge appear in the mirror it looks, from the reflections of the light, like a pale or white line. The glosso-epiglottic ligaments have been already shown in the figure, as also have the outer surface of the arytæno-epiglottidean folds and the inner surface of the wall of the pharynx.

The true vocal cords, sometimes called from their position the inferior vocal cords, are the next most prominent objects in the image. They stretch from the front to the back of the larynx, and the moment its cavity is illuminated may be seen in the mirror as two smooth, white bands, standing out in remarkable contrast to the surrounding red structures, and alternately approaching and receding from each other as the patient breathes. These two moving bands once seen will never be forgotten. Their importance can scarcely be exaggerated; they are, as their name implies, the true vocal organ, the voice being the expression of their various vibrations. On deep inspiration they separate widely posteriorly, but are near each other anteriorly, as may be seen in fig. 3, plate II. On the emission of a sound they approach each other until in the median line they look like two white parallel bands, closing the glottis, as the fissure or chink between them is called. They are strong, fibrous bands, covered by a very thin layer of non-ciliated mucous membrane.

After the cords, the next most striking objects in the

view are the prominences composed of the arytænoid cartilages, surmounted by the cornicula laryngis. These arytænoid cartilages are so called from their resemblance, when approximated, to the mouth of an ancient cup or ladle (*ἀρύταινα*, another form for *ἀρυτήρ*, a name applied to any small vessel for holding water). Their situation is at the back of the larynx, at the upper border of the cricoid cartilage, one on each side. They are, therefore, right and left; the form of each is somewhat pyramidal. The apex of each pyramid is pointed, and curved backwards and inwards. Each apex is also surmounted by a small conical nodule, called the corniculum laryngis, or cartilage of Santorini (fig. 6), to which is attached the arytæno-epiglottidean fold. These parts are more prominent when the vocal cords are closed, and to see them the patient should be made to emit a vowel sound—eh, ah, &c. The mucous membrane is here of a redder hue than in the other portion of the larynx.

In the folds of mucous membrane extending from these bodies to the sides of the epiglottis, already spoken of as the arytæno-epiglottidean folds, we observe two other elevations, called the cuneiform cartilages, or cartilages of Wrisberg. They are seen in both the open and closed larynx, in front of the prominences just described. The cartilages of Wrisberg vary somewhat in their appearance. Occasionally, they seem triangular in shape, their apices pointing outwards; more frequently they appear nearly round. It is obvious that the variations partly depend upon the amount of submucous areolar tissue around them,

and partly on the breadth of the folds in which they are located. There are also great differences in the degree to which these cuneiform cartilages are developed. Sometimes they are quite invisible; while occasionally another distinct elevation can be made out between them and the cornicula. These are probably caused by small additional cartilages. The arytæno-epiglottidean folds bound the superior opening of the larynx, and can easily be observed in the mirror, extending from the arytænoid bodies upwards and forwards to the sides of the epiglottis. They are usually paler in colour than the prominences mentioned.

The *false* vocal cords, so called as they do not assist in the formation of the voice, are in a lower plane than the arytæno-epiglottidean folds, but above the true cords, and so sometimes called by anatomists *superior*. They are thickish bands, extending from the arytænoids to the angle of the thyroid cartilage, and their colour is rather deeper than the folds above them. The space between them is called the false glottis. Their lower edge borders the ventricle and looks a little paler from the light being fully reflected from it. The openings into the ventricles, or, as they are sometimes called, the sinuses, of the larynx, are seen as mere dark lines between the true and false cords. Each ventricle is described by anatomists as an oblong fossa, bounded above by the free, crescentric edge of the false vocal cord; below by the straight edge of the true cord; externally by the thyro-arytænoideus muscle. The anterior part of the ventricle leads to a *cul de sac* of mucous membrane

between the false cord and the inner surface of the thyroid cartilage. This recess or pouch, conical in form, has been compared to a Phrygian cap, and is named the sacculus laryngis. Its mucous surface is studded with the openings of sixty or seventy follicular glands, which lie in the areolar tissue beneath.

Between the arytænoid bodies there is a fold of mucous membrane, the inter-arytænoid fold, or the posterior commissure, the prominence of which depends on the position of the cords. When they are wide open its surface may be examined, but when they are closed it folds together.

So much for the several parts of the laryngeal cavity, but we can see farther still with our mirrors. When the glottis is wide open we may see some of the rings of the trachea showing through their mucous membrane with great distinctness. This membrane is generally paler than that of the larynx, but this may partly depend on its being less brilliantly illuminated. The rings of the trachea, from the reflection of the light, often look quite white. Another point we may also bring into view is the cricoid (κρίκος, a ring, εἶδος, shape) cartilage. Lastly, we can sometimes also see the openings of the bronchi. These and the tracheal rings are clearly shown in plate II., fig. 3.

Such being the natural form of the image, we are prepared for the changes caused by disease. Deviations may originate in loss of substance or in swelling, or in new formation; besides which, change of shape may be produced by external pressure. Loss of substance may be seen in ulceration—*e.g.*, the epiglottis may be serrated at the edge by this process; or it

may be almost destroyed, as in plate II., fig. 6. Both true and false cords and other parts may also be ulcerated. Swelling changes the form in a remarkable manner; and examples may be seen in the plates. The enormous swelling about the arytænoids in plate II., fig. 5, is so frequent in some forms of consumption that it has been spoken of as pathognomonic of that disease. The epiglottis is at the same time often altered in shape from a similar cause. In simple inflammation there may be considerable swelling, as in plate II., fig. 1. In œdema the change of form is still more remarkable; the glottis gradually becoming obliterated, so that the patient is in imminent danger of suffocation. Instead of simple tumefaction, the mucous membrane may be covered with exudation, and this may encroach on the glottis, causing a narrowing. Again, new tissue may be formed, as in polypi (plate II., fig. 4) and cancer; or any of the natural tissues may be hypertrophied. We may, too, discover blood, pus, and other products of disease in the larynx.

In the same way variations of colour are equally characteristic. There may be increase of colour, as in congestive diseases, and this may extend over a large or small surface. In fig. 1, plate II., the red is seen at the arytænoids and on the false cords. In fig. 2 it is more marked on one side, and not so deep. In several the false cords are heightened in colour. So the hues of active and passive congestion can be distinguished in the mirror, as, too, can diminution of colour, local or more extensive. Pigmentation is a change of colour, also readily recognisable. The

author has often drawn attention to the differences between the colour of consumptive and syphilitic cases.

In addition to changes of colour and form, the laryngoscope reveals alterations in function. We have seen that the movements of the vocal cords can be watched in the mirror: these movements may be impaired or exaggerated. Impairment may proceed to abolition when we have paralysis; so increased motion may produce slight symptoms or dangerous spasm. Moreover, defective co-ordination, as shown in the author's paper at the British Medical Association at Cork (August, 1879), may give rise to irregular motor derangements.

Laryngostroboscopy is the name proposed by Oertel for the plan of studying the vibrations of the vocal cords by means of a powerful light rapidly interrupted. The most convenient mode of interruption is by a perforated revolving diaphragm placed between the lamp and the laryngoscope.

RHINOSCOPY

Is the term applied to the exploration of the posterior nares and upper pharynx by means of reflected light. Some slight alteration of position may be needful, but the apparatus is managed as in laryngoscopy. The mirror, somewhat different in size and shape, must be held in a position varying with the part to be illuminated. Carrying it behind the uvula and velum, it is comparatively easy to make

out their posterior surfaces. These should then be traced upwards, and the roof or vault of the pharynx examined. The next engraving, fig. 8, shows the simplest method of rhinoscopy.

FIG. 8.

What is called the rhinoscopic image is really the combination of several views, each of which is separately examined by the observer. The mirror is held first on one side and then on the other. In each case it is moved more freely than in laryngoscopy, so as to examine as wide a field as possible and then the two halves—each composed of the several views thus obtained—are blended into one in the observer's mind.

It is easy, therefore, to understand that exactness is only to be attained by the utmost care, and all the observer's knowledge and attention are required to appreciate the various views revealed in rhinoscopy, and deduce from them correct indications. At the same time, though this is the most common mode of proceeding, there are cases in which a view of a considerable portion of each half may be obtained in the same image.

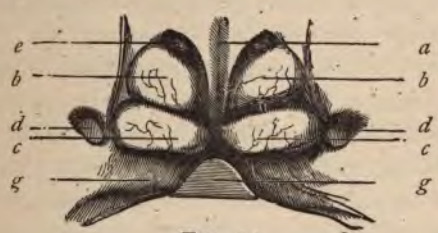

FIG. 9.

a. Posterior border of the septum nasi ; *b, b.* middle turbinated bones ; *c, c.* inferior turbinated bones ; *d, d.* orifices of the Eustachian tubes ; *e.* superior turbinated bone ; *f.* spatula ; *g.* soft palate.

The *septum nasi* (*a*) divides the rhinoscopic image into two halves, and one surface of it should be clearly made out on each side. It forms a shining central ridge, narrow below, but increasing in breadth above At its lowest narrow part, if well illuminated, it may look quite white and bright from the bone shining through the thin mucous membrane. If the light be less brilliant or the membrane not quite so thin and tense, the hue may be pale pinkish, or there may be a yellowish tinge. The colour becomes deeper as the septum extends upwards, until at the highest, broadest

part it is lost in the red of the mucous membrane of the surrounding parts. It may be added that the septum nasi seldom occupies the exact centre of the image, but leans a little to one side or other, so that we rarely see a rhinoscopic image precisely symmetrical.

The *middle* turbinated bones (*b*) occupy a large portion of the image on each side of the *septum*. They are covered with thin mucous membrane of a pale pinkish hue, and have been mistaken by beginners for nasal polypi. Just below, and much resembling them, at the base of the *fossæ nasi*, are two other, somewhat smaller roundish projections, looking like a pair of almost solid tumours. These are the *inferior turbinated bones* (*c*). They do not seem to approach so near to the *septum* as the middle ones, and moreover look more solid and duller in colour, no doubt partly due to their being less brilliantly illuminated.

Just outside and behind the inferior turbinated bone we may easily discern the irregular, trumpet-shaped opening of the Eustachian tube (*d*), the large size of which often surprises the beginner. Indeed, many find it easier to look for the Eustachian orifice first, and from that to trace the other parts. These openings, which are large enough to admit the little finger, look downwards and outwards, and are often rendered more conspicuous by the parts below them being of a yellowish colour. From their lower edge running downwards and inwards there is a prominent ridge formed by the levator palati, while from their upper ridge starts the fossa of Rosenmüller, which extends upwards and inwards, and in which the Eustachian catheter may get lodged.

The *superior turbinated bones* (*e*) may be mentioned next. They are not nearly so easy to find with the mirror, in which they are usually reflected only as narrow projections, in shape almost like a triangle, with its apex pointing downwards and inwards, and perhaps somewhat backwards.

We have yet to mention the three passages between the turbinated bones. The superior meatus is the largest, but the easiest to discover is the middle one which appears towards the outer wall of the fossa. The inferior meatus is very indistinct, often appearing only as a dark line, and to the beginner seldom visible.

Below the nasal fossæ it is easy to make out the posterior surface of the uvula, velum, and pillars of the fauces, &c. Above is the vault or roof of the pharynx, but this appears posteriorly in the rhinoscopic image, and being seen in perspective, is considerably foreshortened. The mucous membrane here is red, dense, and arranged in raised ridges running longitudinally and rather irregularly. The dense adenoid tissue is further gathered together in a more or less distinct prominence, called sometimes the pharyngeal tonsil, which may in adults be a quarter of an inch thick, but is much less in children. It has been thought that this formation was pathological, but it can be observed in the new-born, though very slightly marked. Sometimes we may detect in the posterior portion of the pharyngeal tonsil a depression or opening. This is the orifice of a sac, the pharyngeal bursa, covered by the mucous membrane, and which Luschka conjectures to be connected with the

pituitary body during intra-uterine life. The sac is by no means constant, and other similar depressions may occasionally be seen. This part frequently is the seat of cysts.

Both anatomically and clinically, the region just described—the upper part of the pharynx—may seem entitled to further discrimination, but as the parts are brought into view in exploring the nares, they are conveniently described under the head of rhinoscopy, especially as the word pharyngoscopy has been applied to the examination of the pharynx by reflected light without the faucial mirror; that is, to inspection assisted by illumination, in which proceeding only those parts can be seen which are visible on ordinary inspection. If, therefore, we wish to distinguish exploration of the upper pharynx by a word, we should have to resort to naso-pharyngoscopy, since the upper pharynx, from its relations to the nose, is also termed the naso-pharynx.

In the practice of rhinoscopy the easiest plan is to pass a small mirror between the uvula and the anterior pillar on one side, and carry it gradually behind the uvula towards the median line. It is then to be withdrawn, taken in the other hand and introduced in the same manner on the opposite side. In this way we may often obtain an accurate idea of each portion of the rhinoscopic image and combine the two lateral views into one, when by a single introduction a much smaller extent of surface could be explored.

In pursuing this method the first point reflected in the mirror is the posterior surface of the uvula, closely following which, or appearing at the same instant, may

be traced the posterior surface of the arches and velum, and perhaps one of the teeth will appear.

The mirror should now pass a little higher up behind the velum, which is followed by the eye as it spreads itself out until at the upper part it seems to finish in a sort of fleshy ledge, just above and behind which the septum nasi and nares come into view. A little patience will now enable the observer to make out the several parts which have been described.

Starting, then, in what may be called the second stage of his exploration from the septum nasi, the observer should trace this throughout its whole length. On either side of the septum, at the broad upper part may be discerned the nasal opening. This may be traced downwards to the red fleshy ledge already mentioned as formed by the velum, and which intercepts the view of the lowest portion of the opening. The nasal opening having thus been made out, we may proceed to trace its outer boundary, which will be found to be formed by the projecting outlines of the turbinated bones. The most prominent and easiest to see is the middle, which appears at its lower border as if the inferior bone overlapped it. Just above this overlapping or upper part of the inferior bone, at the outer border of the middle turbinated bone, is the middle meatus, and upon the outer side of this we come upon the Eustachian orifice.

The reverse order may, of course, be adopted, and sometimes it will be found easier to begin with the Eustachian tube, and trace the other structures between it and the septum. Frequently, the Eustachian orifice is easily discovered by beginners, who

find considerable difficulty in obtaining a clear image of the septum and turbinated bones. It is desirable to be able to start from any point, and follow the outline of all the parts as they come successively into view. This will be found possible after a little practice. The general outline of the image must, of course, be familiar to the eye, and then we may begin at any point and pass towards any other without confusion, just as when looking at a map of a locality we know, we glance from one spot to another without losing our consciousness of their relative positions.

It will be seen that a considerable extent of surface can be explored by means of rhinoscopy, and the value of this art may be inferred from the fact that any or all of the structures which enter into these parts may be the seat of disease, and the exact morbid condition may be brought to light in the mirror.

The use of the rhinoscope enables us not only to see the exact site of the disease and to determine its nature, but also to apply local treatment. The rhinoscope is therefore obviously of importance in congestion, inflammation, thickening ulceration, or other affection of any part of the mucous membrane which can be brought into view, while it often at once brings to light polypi or other nasal tumours, or demonstrates the cause of long-standing ozæna and enables us to cure this obstinate ailment.

Every form of nasal discharge should be investigated by rhinoscopy, which also affords aid in diphtheria and other acute diseases affecting the

nasal passages. In obstinate rhinitis, purulent catarrh, abscess within the passages, hæmorrhages, and other painful or distressing ailments, the rhinoscope gives certainty in diagnosis and precision in treatment. Foreign bodies and concretions may be discovered and removed by the aid of the mirror; the conditions on which perversion or loss of smell depend may often be found out; and even in pure neuroses the absence of tangible change may be ascertained.

The various forms of disease to which the upper pharynx is liable can only be properly observed and treated under the guidance of the mirror, and even when the lower pharynx seems the chief seat of the morbid process most valuable information may be obtained by exploring the condition of the parts above.

In cases of deafness dependent on disease of the Eustachian tubes the rhinoscope is also useful.

ANTERIOR RHINOSCOPY.

This term has been applied to the examination of the nostrils from the front, which is a very useful supplement to the exploration already described. The patient retaining his position before the observer may be directed to incline his head so far backwards that the light is easily reflected into the nostrils, each of which can thus be examined. If the sides of the nostril be rather close together a probe or any convenient small instrument will easily separate them.

If necessary, the nostril may be dilated by a bivalve speculum or any of the ordinary nasal dilators.

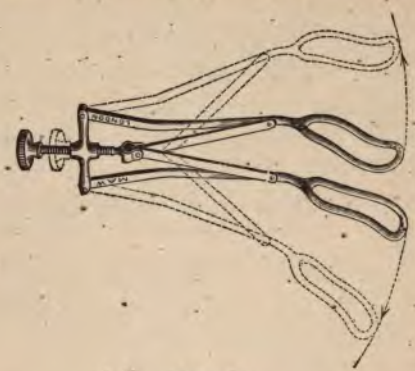

FIG. 10.

Many years ago, Messrs. Maw, made for me a dilator (Fig. 10) on the principle of the eyelid retractor, in which, by means of a screw, the degree of dilatation can be exactly graduated. The one commonly sold as Fränkel's is constructed in the same way. This instrument I constantly employ.

By anterior rhinoscopy we can explore the entire anterior portion of the nasal passage from the superior turbinated bone above to the floor below.

The lateral boundaries of the nostrils, especially the inner one formed of the septum, should be carefully examined. This partition, which is of a pale red colour, does not often occupy the median line, but deviates a little to one side, most frequently to the left, so that the two nostrils do not present corresponding appearances. We may next note the condition of the prominence caused by the middle

turbinated bone, the anterior surface of which looks towards us, and below it we trace the front and part of the inferior surface of the lower bone. Each of these three protuberances is pale, red, and shining. The inferior border of the middle prominence is normally so pale as to contrast with the rest of the membrane which covers this part. The inferior prominence is of a deeper red. The appearances may be much disguised by secretion. Sometimes it is necessary to wash out the passages with the syringe or irrigator. In other cases particles may be removed with cotton wool or a brush. The appearance of secretions in this part varies so much that mistakes may easily be made, and it is only by experience that all the differences of the view compatible with health can be appreciated.

In exceptional cases, when the meatus is large and unobstructed, we may see through to the pharynx while practising anterior rhinoscopy; but usually, in order to explore that region from the front, we should have to resort to some such contrivance as Zaufal's tubes.

Pathological changes of colour and form reveal conditions similar to those already discussed. Thus congestion, inflammation, swelling, erosion, ulceration, new formations, foreign bodies, perverted secretions, malformations, old cicatrices, and other changes can be investigated by anterior rhinoscopy, which also guides us in treatment. Occlusion of the passages occasioned in various ways may also be found, and relieved.

Auto-Rhinoscopy.—This term is used sometimes

for the self-demonstration of the parts described in the same manner as auto-laryngoscopy in reference to the larynx.

PHARYNGOSCOPY AND ŒSOPHAGOSCOPY.

In speaking of rhinoscopy I showed that part of the pharynx can be very completely explored, and some have proposed to give this a distinct name, though we might almost as well apply it to the simple inspection of the fauces. If, however, we turn our attention to the upper portion of the alimentary canal we find it is not so easy to examine as is the air tube. The pharynx, indeed, is easily explored. Its posterior wall can always be seen without a mirror, while with one the upper walls and roof may, as we have shown, be easily brought into view; but turning our attention downwards we are arrested.

Many efforts have been made to overcome the obstacles offered to the exploration of the œsophagus by reflected light. The walls of this tube fall together instead of remaining open like the larynx and trachea. Hence it is necessary to have some mode of separating the walls at the same time that the light is directed along them. Semeleder has, perhaps, done more in this direction than any one, and by practising upon himself has demonstrated to others a portion of the tube. One inch or two may, with perseverance, be revealed, but the operation is very trying, and seems more likely to be practised for curiosity than with the hope of its becoming of any great clinical use. It is

no easy matter to tolerate a tube in the position required, much less the movement of such a tube, so as to expose successive portions of the membrane. Happily, the œsophagus can be explored by other methods.

CHAPTER III.

GENERAL TREATMENT OF SORE THROAT.

BEFORE proceeding to discuss the diseases of the different organs of the throat, it is desirable to describe certain details of treatment which are chiefly applicable in this locality; for, inasmuch, as the manifestations of morbid processes vary according to the region involved, so our therapeutical methods must be adapted to the exigencies thus brought about. Of course the modifications caused by other circumstances will be also carefully weighed by every judicious physician. In every case the age, sex, constitution, and family history of the patient, with other circumstances which make up his individuality, in reference to disease, require consideration, but this is equally true in affections of other regions. In this chapter, therefore, they will only be incidentally referred to, our attention being confined to points of interest in relation to the therapeutics of the throat.

In diseases of this part it is often our first care to prevent disorganisation, or even temporary change of form of only slight extent; for a degree of swelling which in other localities might be regarded as merely

trivial may here prove rapidly fatal. Now changes of form so often originate in inflammation, that, whether we can arrest that process or prevent its results may be no mere philosophical speculation, but a practical question, on the answer to which hang the issues of life and death. Hence it is, that in this as in other localities we so often prescribe measures which are reputed to possess the power of controlling inflammation or its consequences. These like other remedies may act either directly upon the part affected, or indirectly through the constitution, topical treatment naturally assuming prominence in proportion as the morbid condition is limited to a small area.

Antiphlogistics, as well as antipyretics and febrifuges need scarcely detain us. When called for in diseases of the throat they are of course employed on the same principles as in other affections, and readers interested in the subject may be referred to a recent treatise of the author's * in which the properties of these and other remedies are described at length.

The application of *ice* is often useful in controlling the circulation of a part, and *leeches* are still ordered for effecting local depletion, but it has been questioned by others, whether the larger part of the benefit which seems to follow their use is not due to the fomentations by which they are usually succeeded. It is important to remember that in children a few leeches are as potent as venesection in adults.

Scarification may be often advantageously adopted. The engorgement is at once relieved, and the effect of

* "Therapeutics of the Respiratory Passages." London, 1885.

the remedy, if judiciously employed, quite surprising. It is particularly adapted to some cases of tonsillitis. The gum lancet is so often used (and perhaps abused too), that it is a wonder a similar proceeding should not have been more frequently carried out in other easily accessible parts. A single scarificatiou will produce more effect than opening a vein, and this at no expense of the vital fluid. Even in infancy, if carefully done, it is safe as well as efficacious. In œdema of the larynx we are able, guided by the mirror, to give relief by lancing the swollen parts so as to allow the fluid to escape. This operation, as will be seen when treating of diseases of the larynx, may be necessary to save life.

Emetics often bring away a quantity of exudation or secretion, and in this way they are of the greatest use in freeing the air tubes and relieving the embarrassed respiration. Some, indeed, imagine that they have a specific effect in restraining the exudative process, and to obtain this they give smaller doses during the intervals between those which provoke vomiting. Others look upon emetics as a class of antiphlogistics, just as they regard purgatives as revulsants, or as a means of reducing the system, but in diseases of the throat emetics should be confined to the important *rôle* of their mechanical action, by which they often render invaluable services.

Aconite.—It may be well to dwell upon the use of this remedy as it has both local and general effects. Moreover, it was in the first edition of this work (1860) that observations were originally published, which have not only become widely accepted, but have been

occasionally attributed to writers, whose only claim consists in copying them from this little book. At that date I offered a caution as to the dose which was in most books overstated. It seems still right to repeat that caution for the new British Pharmacopœia (1885) sanctions doses which are needless and may be dangerous; although a cautious use of this medicine is unattended with risk, it may, if recklessly pushed, destroy life, rapidly and unexpectedly, for its toxic properties develope themselves rather suddenly if the first indication of its action be unheeded. All the good effects may be obtained by small quantities, repeated at longer or shorter intervals, according to the rapidity of the action desired. I stated in 1860 that after having used it in thousands of cases, I had never produced alarming symptoms, and knew no medicine which less frequently disappointed my expectations. Further, that I had given it once, twice, or thrice a day for a considerable time, every four, three, and two hours for a shorter time; and sometimes repeated a dose every *half* hour, carefully watching the patient. Others have since claimed great credit for the *discovery* that a dose may be given every *quarter* of an hour!

After a few doses, sometimes after a single one, the action of the drug is observed, the pulse is reduced in frequency and power; in some cases the power is increased, the frequency diminished. The skin becomes relaxed and bedewed with a gentle perspiration; nervous irritability and excitement are allayed, a calm comes over the patient, and often sound sleep returns after a long absence. The pain is relieved almost as certainly as when it is locally applied for neuralgia.

Clearly, then, it is a valuable sedative, exercising a marked influence over the heart.

If a drop of the tincture be placed on the tongue, it is found to be acrid and bitter, and this taste is soon followed by a numbness or tingling in the mouth and fauces. Now, when the full action is produced, in giving this medicine, a similar sensation to this is perceived in other parts. The patient will declare or complain that he feels "numbed," or that he has the "pins and needles," or that he feels "just as if his feet had been asleep." This sensation may be very local —confined to the toes, fingers, or eyelids; or may extend up the extremities, almost over the whole body according to the susceptibility of the individual. The remedy must now be discontinued, or the dose diminished, and only given just often enough to keep the system under its influence. This sensation is to aconite what salivation is to mercury. By it we shall not be misled. Like salivation, it may sometimes seem to fail, at others the effect may follow a single dose, but, on the whole, it is a certain measure of the patient's tolerance of the drug. The reader may easily produce the sensation on himself by taking a drop or two in water two, three, or four times a day.

The medicine is useful in all febrile ailments; in nervous excitement; indeed, whenever the heart's action is quickened or the temperature increased. There are few diseases in which I have not at some period exhibited it. I often make it serve the place of salines, and in many cases it is an excellent substitute for digitalis. When sufficiently diluted, tincture of aconite is tasteless—a recommendation of no small

value to some people. For children, a little syrup makes it as palatable as sweetmeats. If not diluted enough, it produces numbness of the fauces by its contact. This property of acting locally on the membrane I have utilised for medical purposes, by giving it in the form of lozenges, or powders, made with sugar. A gargle may also be carefully used; it should not be too strong. Besides these modes, we may paint the membrane with the tincture, diluted with glycerine and water. This arrests pain, and sometimes puts a stop to inflammation; but, if carelessly done, is exceedingly unpleasant, as it may paralyse the soft palate, so that the uvula falls on the epiglottis, and causes a suffocative cough, or feeling of choking, to the patient's great discomfort and alarm. Its active principle, aconitine, is best adapted for external use, since its strength is such when pure, that Pereira states that 1·50th grain had endangered the life of an individual, and Dr. Headland * calculated that the tenth part of a grain would be certain death to an adult man.

Iodine.—There are forms of throat disease which yield to iodine, and to nothing else. Its effect on the glandular system is well known, and it is often applied locally. The tonsils are sometimes painted with it, but as its stimulating action on the surface often results in induration, fumigation is preferable. In hypertrophy of these organs as well as in bronchocele and other cases, it is used for interstitial injection. Solutions and tinctures of various strength produce

* "Action of Medicine," Prize Essay, 1852.

different effects. *Iodide of potassium* has a special value in syphilis, and cannot be dispensed with, though we may also use, as I have long taught, *iodide of sodium, ammonium,* or *calcium.* The last salt is specially useful in strumous cases. In anæmia, we may prefer the iodide of iron. *Iodoform* possesses peculiar advantages as a means of introducing iodine into the system, and as a most efficient topical remedy. In a paper read before the Medical Society of London, 1871, I pointed out the relative value of the salts of iodine, and the cases in which the sodic or calcic bases should be preferred. In the same paper iodoform, then a novelty, now in universal use, was shown to be of great value as an internal as well as a local remedy. These points were again asserted in some articles on Syphilitic Disease of the Throat* and the views then advanced were widely endorsed in a subsequent discussion on the subject.† The use of these preparations is continually extending in throat and chest diseases, so that space can scarcely be found for an enumeration of their applications.

Salines.—Nitrate of potassium is a popular remedy, which for mild inflamed sore throat retains its ancient reputation. Chlorate of potassium exercises more influence on mucous membrane. In some forms of stomatitis it is almost a specific, and since it has become generally employed, has been the means of saving many a life. Its influence is generally acknowledged over thrush, but it is of use in other

**Medical Press and Circular*, Dec. 6, 1871, Jan. 10, Feb. 28 1872.
† *British Med. Journal*, 1878.

conditions of the mucous membrane. It is curious to notice from time to time cropping up a conjecture that it also acts by supplying oxygen to the system, since it contains a large proportion of that element, but Wöhler* showed long ago that it does not undergo any chemical change in its passage through the system —a fact fatal to this hypothesis. It is a saline, and has a cooling diuretic action, but its chief use is for its local effect. It may be given in lozenges, and enters into many gargles, washes, douches, &c.

I have for many years employed the analogous sodium salt—chlorate of soda, as it was called, chlor*ate* (to be carefully distinguished from chlor*ide*) of sodium as it will be called now the Pharmacopœia has adopted the chemical nomenclature. This chlorate possesses the valuable therapeutic properties of the potassium salt, while it is much more soluble, and is for other reasons preferable. I have long preferred for various purposes the combinations of sodium to those of potassium, and constantly taught the superiority of such combinations with bromine, iodine and other substances. My chlorate of sodium pastilles have for some years been in use, instead of chloride of potassium lozenges.

Chlor*ide* of sodium suits some chronic cases of foul, indolent ulcerations in cachetic subjects where the chylopoietic functions are much deranged. As an emetic it possesses saline properties, with their beneficial action in the circulation, and is itself a normal constituent of the blood. A strong solution of it is also suited for topical application in exudative inflammation.

* Zeitschrift f. Physiologie, 1824.

Astringents.—Alum is one of the oldest of topical applications. As an ingredient of astringent gargles it is unexceptionable, and the fauces may be sometimes painted with a strong solution of this salt, but, perhaps chloride of aluminum is better. Powdered burnt alum is also used by insufflation in some chronic diseases of the fauces, especially in the neighbourhood of the Eustachian tubes. It has also been recommended in diphtheria. Zinc, iron, and copper sulphates, and other metallic salts are, in like manner employed in several states of the membranes. Solutions of various strengths may be applied by means of cotton-wool, sponges, probangs, or camel-hair brushes. These salts are likewise useful ingredients in sprays, gargles, washes, &c. Tannin, the chief of vegetable astringents, is also extensively used as a topical remedy, especially in the form of gargles and sprays, and the glycerine seems to be becoming a routine remedy with not a few.

Solvents.—Lactic acid, lime water, pepsine, and papain have obtained considerable repute as solvents of false membrane.

Antiseptics.—Carbolic acid may be employed in various forms. The sulpho-carbolates may also be referred to as possessing valuable properties. Sulphurous acid may be used more concentrated than is commonly supposed. Other antiseptics and astringents are also useful.

As *sedatives*, solutions of bromides, of morphine, and other alkaloids are used.

Anæsthetics.—The recent discovery that cucain, the active principle of cuca or coca erythroxylon, produces

local anæsthesia is of the highest importance. A weak solution of the muriate of cucain (2 or 4 per cent.) is often sufficient, but sometimes much stronger solutions may be requisite. It depends somewhat on the degree of anæsthesia required, and the depth to which it is desired the influence should extend. It is only necessary to paint the part from one to three times, at intervals of three to five minutes, when local anæsthesia is produced, lasting from fifteen to thirty minutes. Operations can then be performed. In intra-laryngeal operations of importance, such as the removal of growths, the value of such an agent is apparent. For this purpose, however, it may be necessary to employ a 10 or even 20 per cent. solution. But apart from such uses the alkaloid is of great value. It arrests and sometimes cures hyperæsthesia and neuralgia. The dysphagia which is sometimes so distressing in laryngeal phthisis may be controlled by cucain. Further, this remedy acts in a striking manner on the circulation where it is applied. It at once produces pallor, and a part may be completely blanched by it. In health, this effect may last some time, and then be repeated. So in disease it may be resorted to in order to remove congestion. I have obtained remarkable results with cucain as a remedy in various diseases, as well as great assistance in difficult intra-laryngeal operations. A weak solution may be used in the form of spray, care being taken that the spray reaches the part required, and is not wasted over a large surface. This remedy may be applied to the larynx, pharynx, nares, or mouth. Indeed it has been already shown to be a very useful anæsthetic to all mucous surfaces.

Escharotics.—Nitrate of silver is constantly used, applied both solid and in solution; the latter being conveyed to the part by camel-hair or glass brushes, by sponges mounted on whalebone, by cotton-wool held in a pair of forceps, and by specially constructed syringes, douches, and sprays. In the solid form it has been used by the insufflator, but this is not a good method. To cauterise by this agent the best way is to employ a small portion fused on a silver or aluminium probe. There is no need to dilate on its properties. It acts almost like a specific on some diseased conditions of the mucous membrane, and is certainly the sheet-anchor in many throat affections. Yet it ought not to exclude other remedies, and lead us into routine practice. Concentrated nitric acid and other strong caustics are required in rapid sloughing and gangrene. They have also been employed in diphtheria. Their application is made on the same principles as to other parts, but the operation is one of great nicety. Caustics have too often been used unnecessarily, and therefore injuriously.

We have next to consider certain methods of applying remedies—

Fomentations are daily prescribed in all painful affections, and are useful adjuncts in throat disease. In this category should be placed the use of hot moist sponges, which the late Dr. Graves so strongly urged in the early stage of croup. But, as a general rule, fomentations are quite secondary to

Inhalations.—The contact of watery vapour with inflamed mucous membrane is very soothing. It cuts short the congestive stage of catarrh by a timeous

supply of moisture, and so relieves the dryness, heat, and itching. In bronchitis, too, it is often of the greatest service, not only by supplying moisture to the inflamed mucous surface, but at a later stage by diluting and assisting to remove the secretion. As the warm vapour penetrates throughout the respiratory tract, it often produces more calm than powerful anodynes. Moreover, this vapour may be easily medicated. The same simple remedy renders great service in croup and diphtheria. I formerly urged the application of steam to the inside of the air-tubes in a more thorough and systematic manner than had previously been recommended, since which several authors have learned to rely on the remedy, and some claim to have *discovered* its value.

A very simple but effectual plan of inhalation, and one which even children willingly carry out, is to get the patient to breathe through a large cup-sponge which has been dipped in hot water and rapidly squeezed. A less efficacious method is to lean over a jug or basin half-filled with boiling water. In this case the patient should not envelope the head in a towel, as many frequently do, for this practice is liable to produce headache and flushing, and so sometimes cast discredit on the remedy. It is easy enough to arrange a napkin or towel round the brim of a jug, so as to enclose only the mouth and nose. For simple steam inhalations these plans suffice, but when we wish to add medicinal agents—though an ordinary jug may be often made to do duty—some kind of inhaler is always more convenient and frequently necessary.

Nelson's or Maw's Double-valved (Fig. 11) answer very well. In Robson's and the Eclectic the air is drawn through the medicated liquid. For use in bed a long tube is convenient, as in Mudge's (Fig. 12). When the

FIG. 11.

FIG. 12.

patient can sit up Lee's Steam Draft Inhaler (Fig. 13) is the least fatiguing, as it delivers the steam at a proper temperature, and no suction is required. For iodine and some other substances, a glass inhaler should be employed, such as Fig. 14.

Any volatile substance can be easily employed to medicate the vapour, and those herbs, the therapeutic value of which depends on an aromatic volatile principle, are often thus used; or the active principle is previously extracted, as in the case of essential oils. The soothing properties of steam are thus increased by employing hops—the vapour of a freshly-made infusion being charged with the sedative properties of

the drug, or lupulin may be employed, or the extract or tincture may be utilised; but the oil must not be substituted, as it is an irritant. Chamomile flowers may be used in the same way. Another aromatic

FIG. 13.

sedative is obtained by putting a teaspoonful of tinct. benz. comp. into the inhaler with hot water. The vapor coninæ of the British Pharmacopœia is more distinctly sedative—its efficacy depending on the conine being set free by the alkali, which for this

reason should only be added at the time of use. The vapor acidi hydrocyanici is employed with cold water, but may be ranked among sedatives. The volatile parts of opium can be utilised by putting the tincture or the solid drug in the inhaler with hot water. Ether and chloroform may be used with hot water at a low temperature. It is, however, obvious that very volatile substances may as well be administered without the medium of water. A very simple inhaler, or a little cotton-wool in a cone of paper, will suffice for chloroform, ether, or nitrite of amyl, which should be given under the superintendence of a medical man, as it is not well adapted for use when diluted as an inhalation even at a low temperature.

FIG. 14.

Besides anodyne inhalations, those possessing stimulating properties are most important. In the British Pharmacopœia there are now four—vapor chlori, creasoti, iodi, and ol. pini. sylv. The mode of using differs in each case, while each vapour is a special stimulant. Camphor is a good stimulant for inhalation. Ten drops of the spirit may be put into the inhaler to begin with. It is better to dilute it with more spirit. In like manner, many of the essential oils can be used as stimulants, either dissolved in spirit or diffused by the process adopted for using fir-wool oil in the new B. P. The oils of aniseed, cajeput,

cloves, cinnamon, marjoram, myrtle, rosemary, and others are adapted for this purpose. Ammonia is a general stimulant often resorted to, and may be utilised for its local effect.

The late Dr. J. A. Symonds* recommended solutions of balsams in ether or pyro-acetic spirit, to be inhaled from an ordinary wide-mouthed bottle, the warmth of the hand holding it being quite sufficient to volatise the liquid. I prefer ether to the pyro-acetic spirit. Spirit of chloroform may also be used by this method. Half an ounce of benzoic acid in an ounce of ether forms a standard solution, to which two drachms of balsam of Peru, or of Tolu, or of any similar substance, may be added. Turpentine has also been used in this way, but might then be made the menstruum. Other rather volatile substances, as creasote, carbolic acid, iodine, essential oils, can, if desired, be employed in this way without steam.

Atomised Fluids, or Sprays.—Liquids which are not volatile can be made available for inhalation by reducing them to a fine spray. So soluble solids can be dissolved, and the solution used in the same manner. All the common atomisers and spray-producers consist essentially of a pair of Bergson's tubes, with an arrangement for driving air or steam through the upper one. The tubes are fixed at right angles to each other, one descending vertically into a bottle of the liquid to be atomised. The rush of air or steam through the horizontal tube exhausts the perpendicular one, the fluid rises, and is sent forward in a fine spray.

* *British Medical Journal*, 1868.

In Siegle's inhaler the force employed is steam generated in a boiler by means of a spirit lamp. In the ordinary hand-ball atomisers the steam boiler is replaced by a pair of bellows consisting of two india-rubber balls with proper valves. The bottle being held in the one hand, and the bellows worked with the other, the spray is inhaled as seen in the engraving, fig. 15.

FIG. 15.

The simplest atomiser is that which I introduced to the Medical Society of London many years ago. It produces an equally good spray, and is so inexpensive as to place this mode of treatment within the reach of all. The tubes are placed parallel instead of at right angles to each other. The distal end of the upper tube is formed into a cup, which holds enough liquid for each occasion. The fluid finds its way by gravity to the point, and the air is blown through the lower tube by the ordinary double bellows. This atomiser

is much more simple in its construction than any other, as will be seen on reference to the engraving, fig. 16. The bottle is dispensed with altogether. The tubes of glass can be replaced, if broken, at a small cost. They may be had of vulcanite or silver if preferred, but the cost is thereby increased. A larger

FIG. 16.

size is also made. My atomiser (Fig. 16) is easier to use than more complicated instruments at a much higher price, and will be found the most convenient apparatus wherever it is desired to use a spray.

I find in practice that sprays are generally useful when it is an advantage to give them cold; while for warm applications I mostly resort to the common mode of inhaling steam impregnated with the remedy,

but my atomiser can be adapted to Siegle's steam inhaler. It is mostly advisable to administer astringent sprays cold, though of course they may be used warm. Anodynes are applicable either way, but more frequently should be taken warm. An advantage of my atomiser is that the tubes can be held far enough in the mouth to prevent the spray spreading over the face. After warm inhalations it is often desirable for the patient not to go into the open air or into a cold room; but the cold spray is the best possible preparation for such sudden changes of temperature.

The remedies most commonly used in the atomiser are solutions of metallic salts, the strength being graduated, so as to produce a tonic or astringent effect on the membrane, according to circumstances. But many other remedies may be employed in the same way, such as disinfectants, alkalies, detergents, anodynes, anæsthetics, &c. Many mineral waters, particularly those containing sulphur or chloride of sodium, have also been largely used in the form of spray. Moreover, the atomiser has been used to fill the patient's room with aqueous vapour, either pure or charged with medicinal agents, or with sea-salt, so as to make an artificial sea-air. Though the plan has now been for some time before the profession, it has probably even yet not received the extension to which it is destined.

Fumigation is a term frequently applied to the plan of drawing the fumes of any substance into the nose, throat, or any part of the respiratory passages. This is accomplished by burning the substance so as to fill the room with the fumes, or by igniting a small quan-

tity in any convenient vessel, and inspiring the vapour as it rises. The former plan is commonly employed for sulphur and some other substances. As, however, the fume or gas is inspired, we might include these under the term inhalations. Unsized paper, saturated with nitre and other substances, when ignited, gives rise to fumes which have been inspired with benefit, particularly in asthma. Dr. Mead recommended the ancient plan of throwing balsamic substances upon live coals, so as to fill the room with the anodyne fumes, and Trousseau and Pidoux favoured this method. Iodine gives off its vapour at a low temperature, so that it can be used in a still simpler manner. A watch-glass containing a little iodine put in a saucer of hot water is a sufficient apparatus. The vapour chlori of the British Pharmacopœia requires no apparatus (though it is convenient to have one), and may be called a fumigation.

Gargles are both popular and time-honoured. Their action, however, is not so extensive as many imagine. In most cases they come in contact only with the anterior surface of the velum and uvula, and perhaps a small portion of the tonsils; but in other persons, as we shall see, they may reach more distant parts. In diffused affections they occasionally exercise a surprising effect; and when one portion of the membrane becomes better for their use, the improvement sometimes seems to extend further than the local application of the remedy, just as we see disease spreading by continuity of surface.

In the act of gargling air is usually expelled through the liquid with sufficient force to cause a

bubbling noise as it escapes into the cavity of the mouth. It is the gurgling sound thus produced, and popularly supposed to be essential, which gives the name to the process; for gargle and gurgle were originally the same words, derived from the Latin *gurgulio*, which means throat, and in its turn may be traced to γαργαρεῶν, an old Greek word with the same signification, and perhaps coined in imitation of the sound, since, notwithstanding Max Müller's contempt for the "bow-wow theory," at any rate the same collocation of sounds serves a similar purpose in still older languages, *e.g.*, in the ancient Hebrew word for throat we find the same reduplicated syllable, *gargar*. Nevertheless, we may derive the full benefit from gargling without making any noise at all, if the liquid be permitted to remain in the position it occupies as long as the breath can be held; besides which, expiration may be carried on so gently that no gurgle is produced. So long as the liquid thus remains quiescent it is in contact with the mucous membrane, and may act upon it—the extent of surface thus affected depending on the position of the parts. If now the patient attempt to swallow, he soon reaches a point beyond which he cannot arrest that action. If in the same way he try cautiously to inspire, he will become conscious that the liquid is approaching the point at which it will set up spasm. The question is, how far we can allow the liquid to penetrate and yet retain full control over it. In this respect we meet with the greatest diversities, some individuals possessing great power over the parts, while others never learn to gargle properly. The ma-

jority of patients require some instruction respecting the end to be served in their own cases. In using a mouth-wash the soft palate descends so as to cut off all communication with the pharynx. In gargling, as frequently understood, the result may be almost the same, the liquid coming in contact with the anterior surface of the velum and uvula only. If, however, the patient should now raise the velum, as many can do, some of the liquid would flow into the pharynx. There it produces a desire to swallow, and unless the patient can control this some of it will pass into the œsophagus and stomach. Some persons, however, instead of yielding to the desire to swallow, suddenly jerk the head forwards, and a quick forcible expiration taking place at the same moment, the liquid is expelled through the nose. What they do involuntarily can be accomplished by others deliberately and without inconvenience. In persons possessing this control over the parts we may often obtain good results from a natural nasal douche thus employed.

It is by no means so easy to let the liquid enter the larynx, and in spite of persistent efforts, many will totally fail in the attempt. Of course, the glottis must be kept closed if the liquid is to rest upon it, and therefore the duration can only be while the patient can hold his breath. M. Guinier, of Montpellier, has shown that it is possible to attain such complete command over the parts as to allow the liquid to flow into the larynx, and remain there for several seconds. This is what he calls * laryngeal

* "Étude du Gargarisme Laryngien." Paris, 1868.

gargling. The mouth should not be quite closed, and the head should not be thrown back, as the less it is raised the less urgent is the desire to swallow. With these precautions M. Guinier takes the liquid into the mouth, brings forward the lower jaw, and closes the glottis by the uncompleted act of emitting a vowel sound. The velum in this disposition of the parts is raised, and the base of the tongue perhaps falls a little, so that the liquid finds its way into the larynx, where, if the patient can completely control the sensibility, it may remain as long as the breath is held. The slightest attempt to inspire will bring on spasmodic cough. Only the few can expect to attain success in this method, and its use is therefore very restricted, especially when we remember that there are other modes of applying liquids to the laryngeal mucous membrane.

It will be observed that it is more important to manage the respiration than deglutition. If compelled to swallow, the patient only receives a small quantity of the liquid into his stomach, and unless that be noxious there is an end of the incident. But if he draw the liquid into the air passage distressing spasm may ensue. Almost every one has seen this at table, when a morsel of food or drop of liquid has by a sudden inspiration been drawn into the larynx, or, as we say, "has gone the wrong way." The best way in such a case is to resolutely hold the breath for a few seconds and then to speak; the utterance of a single syllable will at once put an end to the spasm. Drinking a little water is often recommended, but can *scarcely* be accomplished until the spasm abates.

The little accident just alluded to generally occurs through talking or laughing while food is in the mouth. Expiration then becoming complete, and the need for inspiration being felt, air is suddenly drawn through the mouth, and carries with it a liquid or solid particle beyond the raised velum, and over the epiglottis into the larynx, where its presence is instantly resented.

Astringents, disinfectants, and antiseptics are the remedies most frequently required in the form of gargle, but anodynes and narcotics may also be utilised in this way. One of the best astringents is a solution of alum, the strength of which may be varied according to the effect required; choralum may be employed for the same purposes. Tannin, a powerful vegetable astringent, may be used with confidence. It is to the tannin they contain that various liquids popularly used as gargles owe their repute. Borax and chlorate of potassium or sodium are also useful as both gargles and mouth washes: the former is slightly alkaline as well as astringent; the latter possesses special value in an aphthous condition of the buccal and faucial mucous membrane. Very weak carbolised gargles exercise a soothing influence, which may be allied to the anæsthetic effect observed on the skin, but stronger solutions are stimulant. As a disinfecting wash and gargle, Condy's fluid is one of the best, but chlorinated liquids are sometimes called for. Diluted mineral acids are sometimes prescribed as gargles; their action on the teeth should lead us to prefer other astringents.

Gargles are generally used cold, but sometimes,

Fig. 17.

especially when containing anodynes, warm, and occasionally, as to restrain hæmorrhage and allay pain, hot. It is in chronic cases they are most suitable. In acute inflammation of the fauces the movement of the parts causes so much pain that the patient cannot gargle. Further, it is not desirable to order gargles for children, unless we know they have learned to use them.

Nasal douches.—I have shown (p. 117) how a kind of natural douche may be taken. To accomplish the same end, and to wash out the passages more thoroughly, we employ the apparatus sold under the name of nasal douche, (Fig. 17). By this fluid is brought into contact with a portion of mucous membrane, which, in the majority of persons, is otherwise inaccessible to such local treatment as the patient can employ. The nasal douche is, of course, most serviceable where the disease is located in the posterior nares, as shown in my paper "On Ozæna," already cited, but it is also of value in some pharyngeal cases. The nasal passages, as well as the

pharynx, may also be medicated by means of syringes and atomisers properly constructed, while the primitive plan of snuffing up the liquid by a series of short inspirations is occasionally preferred. Some persons have a trick of thus taking up fluids from the hollow of the hand, or from any shallow vessel—a sort of "drinking through the nose," which may be turned to account in the case of nasal disease. The liquids most serviceable for the nasal douche are weak alkaline and saline solutions. A drachm of chloride of sodium in a pint of water is constantly prescribed, but half-a-drachm of carbonate of soda in the same quantity is more efficacious and more agreeable, and Weber-Liel* has shown that it is not so likely to injure the ear—a conclusion in accord with my experience. Astringents may be resorted to in many cases, but only in *very small quantity*, the membrane here being exceedingly sensitive. Many cases of headache, local irritation, or other unpleasantnesses, are caused by too strong a solution being ordered. By this the mucous membrane may always be thoroughly freed from the discharges, and thus prepared for other remedies. In all cases the nasal douche should be used tepid at first. Occasionally it may be desirable to decrease the temperature, especially when astringents are employed. The douche should be used once a day, sometimes twice, but it may be necessary to continue it for a long time.

Irrigation.—I have designed tubes with perforated

* *Berlin. klin. Woch.*, 1878.

extremities, by means of which the nasal passage can be carefully irrigated by the physician, both from the front and back. *Syringes* and *atomisers* constructed for the purpose can also be used to convey medicated fluids to the nasal passages.

Insufflations.—Powders may be applied to the nasal or pharyngeal mucous membrane by means of properly constructed insufflators. They are often very useful as adjuncts to other treatment—particularly diseases near the orifice of the Eustachian tube, and other conditions giving rise to deafness.

Snuffs.—Sternutatories and errhines, if old-fashioned, are often useful in disease of the pituitary membrane, and are readily used by snuff-takers. A great variety of drugs may be employed in this manner, especially astringents, absorbents, and antiseptics.

Nasal Bougies sometimes assist in diagnosis, but are more valuable in treatment. They should be made of the finest vulcanite, which can now be had quite flexible. These bougies may be used for their mechanical effects, or made purveyors of drugs with which they are coated. Soluble medicated bougies of gelatine, &c., are also useful, and may be left to dissolve in the nasal passages. Plugs of cotton-wool medicated with various substances may also be employed.

Linctus.—In order to somewhat prolong the action of fluids, they may be rendered thicker and more glutinous by sugar and other additions. This is the philosophy of the linctus, loch, or lohoch, called also eclegma, eclectos, ecleitos, elegma, and illinctus; all terms derived from εκλειχω. Various syrups and

mucilages may be used for the same qualities, or may enter into the composition of the linctus. Glycerine, from its slowness to evaporate, may be used to attain the same end, and is indeed rather too popular, for since the introduction of glycerine of tannin into the pharmacopœia, its routine use has become quite an abuse.

Confections or *electuaries.*—In these we have a tenacious semi-solid substance, which may be slowly dissolved in the mouth, and thus the local action of its ingredients further prolonged; but these preparations are also used as vehicles for systemic remedies. In confectio opii the galena, mithridate, philonium and theriaca of antique pharmacy survive.

Lozenges may be looked upon as the modern representatives of the ancient remedies termed, from the dose being placed under the tongue of the patient, "hypoglottides," and which Galen, Dioscorides, and others were accustomed to prescribe.

To obtain the local effect of lozenges, they should always be allowed to dissolve in the mouth without breaking them by the teeth, and should also be swallowed very slowly, so as to prolong their action as much as possible. But as lozenges are swallowed, their effect on the stomach is not to be forgotten. Indeed, their liability to interfere with digestion is one of their disadvantages. Some lozenges are only of use for their constitutional effects; they are, in fact, merely dosed general remedies. Others, however, are most valuable for their local action. It is obvious that these two qualities may often be combined.

The uses of lozenges have been fully considered in

my paper on "Local Remedies in Diseases of the Throat and Mouth," at the annual meeting (1880) of the British Medical Association at Cambridge. I then laid down that for special topical use lozenges should possess the following qualities:—1. They should dissolve slowly in the mouth, so that the resulting solution of the medicament may remain as long as possible in contact with the mucous membrane; 2. They should possess a certain degree of softness, so as not to hurt the diseased surface mechanically; 3. For the same reason their shape should be without corners; 4. Their flavour should be agreeable, or as little distasteful as possible; 5. They should keep without change for an indefinite period, as they cannot be advantageously made in small quantities.

The lozenges of the British Pharmacopœia are most defective on account of their hardness. They irritate the mucous surface; and the sharp corners of some shapes in common use, or of the broken pieces of others, may enlarge ulcers, tear congested membrane. or do other injury. Of course, when used for their constitutional effect, these objections may scarcely apply. A softer consistence has been attained by the employment of fruit-paste, as in the favourite black currant lozenges, and this substance has been more extensively used of late years. Extract of liquorice, as in "Pontefract cakes," and gelatine have also been utilised. A more recent innovation is the effervescent base introduced by Mr. Cooper, which, for some purposes, is of special value. The French, so famous for all kinds of confectionery, have given us the *pâte de Guimauve;* but the defect of this is that it does not

keep well. We owe to them also our best jujubes, a sweetmeat first made with the juice of the *Rhamnus zizyphus*, but now never containing that agreeable fruit. Experimental experience, extending over more than a quarter of a century, leads me to conclude that a *pâte de jujube* of the best French method of manufacture will be found most generally useful as a base. It fulfils all the indications required; it can be variously flavoured and coloured, divided into lozenges of any size or shape, and medicated with the most suitable remedies. It does not excite nausea or cause indigestion, and does not change too much after months of exposure. It is, therefore, adapted for lozenges prescribed for their topical influence, and is equally available for those given for their effects on the system.

Lozenges are more extensively used than could have been supposed when the London and Dublin Pharmacopœias rejected them. Everyone who remembers that time will know that, in spite of that discouragement, every large pharmacy was obliged to keep a considerable number. I have a list of upwards of 150 tried formulæ in use at that date. It comprises nearly all in common use now. Rhatany, an excellent astringent, still extensively prescribed for local purposes, is in that list and was known long before. So with cubeb lozenges, which have lately been forced into extensive sale by a vendor who vaunts them as "bronchial troches." We have, in fact, few new lozenges. Red gum has been introduced; so, too, has carbolic acid; chlorodyne can scarcely be counted, being only morphia disguised; superior glycerine jujubes may be had at any leading pharmacy, or of inferior quality as an advertised panacea.

The lozenges comprised in the long list alluded to might be classified according to their therapeutical uses—*e.g.*, astringents, demulcents, sedatives, special stimulants, &c. It will suffice, however, to refer as illustrations to those made from my formulæ by Messrs. Allen and Hanburys, who have long sold them under the name of pastilles. As the words *trochisci* and *tabellæ* have become associated with the harder lozenges, as jujubes seem to savour too much of sweetmeats, and as these are distinctly medicinal agents, we call them "pastils," an old English word more familiar in the French *pastilles*, and derived from the Latin *pastillus*, which was used by Celsus for such a purpose; *pastilli* is, therefore, an appropriate name in prescriptions.

With regard to dosage, those pastilles, which are intended to replace the British Pharmacopœia lozenges, have been made of similar strength, as it was considered advisable not to burden the prescriber's memory too much. This is specially the case with the pastilles of morphia, those of morphia and ipecacuanha, and those of opium; in each of these the pastille may be regarded as an agreeable substitute for the lozenge. So, too, with the simple ipecacuanha pastille, which will be found much more popular with children than the lozenge, The same remark applies to *pastilli ferri*. Each pastillus aconiti may be considered equivalent to half a minim of British Pharmacopœia tincture, and prescribed accordingly. The pastillus expectorans, or morphiæ et ipecacuanhæ compositus, is a combination of the simple one with other expectorants, and will be found most serviceable in bronchitis, *chronic coughs*, &c. The chlorate of potassium pas-

tilles are not so strong as the lozenges, and may be taken in twice the usual doses; they are, however, very efficacious, and the disagreeable flavour is so successfully concealed that few can detect it. If large quantities are needed, other modes of administration may be tried. The chlorate of sodium pastille is an efficacious and pleasant substitute. The lithia pastille contains a grain of the carbonate, and is valuable for both its local and remote effects. The benzoated pastille will be found the most agreeable of all mild voice lozenges, and may be taken shortly before speaking, reading, singing, preaching, &c., to give tone to the vocal apparatus. In obstinate or chronic cases, the camphorated pastille is a still more powerful voice-lozenge, but, unfortunately, its flavour is not nearly so agreeable. This is, in fact, the only one of the series that can be considered unpalatable.

LARYNGOSCOPAL THERAPEUTICS.

Most of the remedies we have been considering may be used by the patient, and are accordingly prescribed, but some of them, as certain sprays and douches, are sometimes— caustics, always—applied by the medical man. We have yet to mention remedies which are only applied by the aid of the laryngoscope, and are therefore not ordered, but used by the physician himself. For topical applications to the larynx, as well as for more important operations within that cavity, the mirror must always be employed, and the term laryngoscopal medication or

laryngoscopal therapeutics is used to designate the proceeding, but of course when the rhinoscopic mirror is used a corresponding distinction might be made. There are other points to which the mirror will help us to apply remedies as surely as it aids to discover disease. It should be used whenever it is able to render assistance. Even in the most accessible parts of the throat topical remedies should be applied with care and only by skilled hands. Not seldom has considerable injury been done by the bungling application of a powerful agent. Firmness and steadiness are indeed required, but with these should be combined the utmost gentleness, and the more delicate the part treated, the greater the skill and care demanded. Thus it is an easy thing to paint the fauces with a non-irritating fluid, while to apply caustic to a minute point in the larynx or nasal passages, and to this point only, is an operation demanding the greatest dexterity.

Liquids are perhaps the most frequently employed to act on the mucous surface. Sponge probangs are sometimes saturated in the liquids and applied to the fauces. In place of these, cotton-wool soaked in the fluid and held in specially-contrived forceps can be used. Camel-hair brushes mounted on handles of various shapes and sizes are generally employed for application within the larynx; for this purpose brushes are so much superior to probangs that the latter are now seldom resorted to, but they are still used in the fauces, where, however, a brush or cotton-wool is equally convenient and often preferable. When it is proposed to use a probang in the larynx it is neces-

sary to have one properly constructed, those commonly sold being quite unfit for the purpose. A variety of sizes and shapes of both brushes and probangs will be found desirable, so that any part may be reached with ease.

The little inconvenience caused by the introduction of a brush charged with fluid into the larynx is a source of surprise to those who have not witnessed the operation. To take the larynx by surprise and bring the brush in contact with its lining with that combination of gentleness and firmness which characterises the skilled hand is far less likely to cause spasm or distress than is the sudden intrusion of a small body, like a crumb or a drop of water, which so frequently, when it "goes the wrong way," gives rise to spasmodic efforts to eject it.

Still, even in the most skilled hands, the brush may occasionally set up a choking sensation, a degree of irritation or pain, a contraction of the vestibule, and even a true spasm of the vocal cords. Such symptoms are, however, very transient, as is also the change in the voice, that may surprise the patient. They give rise to alarm in the mind of the sufferer, who, if not forewarned should be at once assured that there is no danger, and, if possible, induced to speak. The utterance of a single word gives complete relief. This, however, may be difficult, and the best plan is to hold the breath a moment or two, and then utter a single syllable, as "oh!" or "ah!" when the spasm will at once subside.

The effects of the mechanical contact of the instrument being temporary, we have next to consider those

of the liquid with which the brush is charged. These differ with the nature of the fluid, which may be stimulant, astringent, sedative, &c. The selection of the liquid will be made in accordance with the principles that guide us in the local treatment of other diseased mucous surfaces, modified only by the conditions that are special to the organ under consideration. The effects of various substances on mucous membrane, especially on the lining of the upper air passages, are more fully stated in my work on "Respiratory Therapeutics." What follows relates to intralaryngeal applications, and may be compared with the statements already made as to sprays, gargles, &c.

Astringents.—Solution of perchloride of iron is invaluable, and may be used in various proportions, from a few grains up to one or two drachms to the ounce. Iron alum and ordinary alum may likewise be used in a solution of 20 to 60 grains per ounce. Of zinc the chloride is the most efficient salt, and its strength may vary from 10 to 30 grains. The sulphate is, however, also useful, 40 to 60 grains being dissolved per ounce, and the acetate, 15 to 30. Chloride of aluminium is a powerful astringent, and may be used in this way as well as by other modes; so, too, may many other substances, including tannin and most astringents.

Alterants.—Iodine is much relied on by some; the tincture diluted with glycerine; or solutions in that liquid of various strengths may be used.

Solutions of silver nitrate were among the earliest employed, and in suitable cases are of great value. Some writers think this substance the most liable of

all to give rise to spasm, and for that reason have nearly discarded it. Others do not accept this doctrine. The fact is, that the effects of this remedy differ much with the strength of the solution. I have used it from two grains in the ounce to 120; and though other remedies may often be advantageously preferred, I cannot look upon it as a simple astringent or consent to altogether deprive my patients of the benefits of its remarkable properties.

Anodynes and *Anæsthetics* are of great service. The use of cucain has been sufficiently explained (p. 104).

The solutions may be made in simple distilled water, or a portion of glycerine may be added. It has been proposed to use the latter only as a solvent, but this is not desirable, as it is an irritating fluid, glycerine being far from the bland liquid it is frequently called. When mixed with water, however, it loses its irritant quality, and the consistence of the liquid is increased. Its slowness to evaporate may also be regarded as some advantage.

Medicated liquids are sometimes injected into the larynx by means of a syringe. It is obvious that with the aid of the mirror there could be no more difficulty about this than about other instruments, provided the pipe of the syringe be of sufficient length and of a proper curve. So, too, we employ a laryngeal douche, in which the same form of pipe is furnished with a cautchouc ball instead of a piston.

The mode of injecting fluids into the larynx by these instruments requires no detailed observations The only requirements on the part of the operator are steadiness and dexterity. The laryngoscope must

always be employed, so that the operator's hand is guided by his eye.

This brings us to consider the special action of injections. Sudden and forcible pressure evidently projects a douche on the walls of the larynx, while the feeblest possible compression will only cause a few drops to exude from the tiny apertures, and collect into one, which falls into the cavity. Between these two extremes there are many degrees of pressure, and the effects will vary accordingly. Unless we intend to use sufficient force to drive the fluid as far as the walls of the larynx, there is no advantage in having the end of the syringe furnished with numerous tiny perforations to break up the stream. If we use sufficient force to project the fluid on the membrane, clearly we administer a sort of shower-bath to the larynx, and the influence of this ought not to be overlooked. There is another difference between the use of syringes and brushes. In using the latter we touch the mucous membrane with a foreign body, and this has been urged against their employment. I have, however, shown that very little irritation is caused by the skilful use of well-made brushes. On the other hand, injections are in reality far more distressing. Whether a powerful douche be projected into the larynx or only a drop or two slowly injected, violent spasm is very liable to be caused. In the former case many would naturally anticipate this result; but in the latter it is quite as frequent, and sometimes more severe. Part of the effect may be due to the shock of the stream on the walls of the larynx; but when only a drop or two is injected, we have just the inconvenience that is

set up when in drinking or gargling, liquid is drawn into the air-tube by inspiration ("goes the wrong way").

A consideration of the little accidents alluded to seems to show that the smallest drop of liquid approaching the cords immediately provokes them to close the glottis; and the tendency of this orifice is to remain shut until the fluid has disappeared from the surface of the cords by becoming diffused throughout the cavity. If the respiration could be easily suspended, this would soon be accomplished in the case of a small quantity; hence the use of the direction to hold the breath. Moreover, the disposition to spasm is exhausted by the contact of the fluid. When the liquid passes by surprise below the glottis, the cough set up is more violent still. Hence it is a common plan to direct a patient to expire during the injection, or better still, to utter a falsetto note.

From what has been stated, the reader will be able to draw his own conclusions as to the relative value of brushes and syringes. In making his estimate he must not forget that by means of the former it is possible to localise the application to a portion of the larynx. This cannot be done so well with the syringe, though it may with care be accomplished when only just enough pressure is used to let a drop of the contents ooze through and collect at the end. For this, however, drop-tubes have been devised.

I have adopted the principle of the pipette for instilling fluids, drop by drop, into the larynx, and this is a more simple plan. The patient should emit a high note during the operation. If through a sudden inspiration, or from the cords being allowed to remain open, and being taken by surprise, a drop of

liquid should pass the glottis, a violent paroxysm of cough and dyspnœa may at once supervene, just as in the other cases in which the same symptoms have been mentioned as likely to occur. For this and other reasons I employ brushes much more frequently than syringes, drop-tube, or pipettes.

Solids.—Insteads of liquids we may apply solid remedies within the larynx. The use of caustics will be considered further on. Here I desire to point out that solid remedies reduced to the form of an impalpable powder may be introduced into the larynx with as much benefit as frequently follows their use in the pharynx. Such applications have been made in various ways. Thus patients have been placed in an atmosphere in which the powder was diffused, others have been taught to draw the remedy into the larynx by a deep sudden inspiration. These processes, however, belong to another branch of the inquiry. At present we are concerned with laryngoscopal therapeutics, or the art of applying remedies by the aid of the laryngoscope. For the purpose of thus applying powders we employ an insufflator, which is an instrument for projecting the fine powder by a puff of air. In the ordinary insufflator of Rauchfuss this is accomplished by means of an india-rubber ball, pressure on which forces out the powder. It is, in fact, only an adaptation of the douche. The difficulty of holding the tube in position while suddenly compressing the ball has led some to resort to other means of blowing out the powder. They have accordingly substituted for the elastic ball used by Rauchfuss a long piece of india-rubber tube, with an ivory mouth-piece. This enables the operator to project

the powder at the right moment by a puff from his own mouth; for it is to be observed that both his hands are engaged, one holding the mirror, the other the insufflator. The objection to this method is manifest.

I have had the openings of my insufflators so arranged as to enable the operator to localise the application to any part of the larynx. This I accomplished by having several tubes, each of which differs from its fellow in the position and shape of the opening.

The idea of injecting a cloud of fine powder into the larynx will to some persons suggest a violent paroxysm of cough as the immediate result. They imagine, perhaps, that a solid, however finely powdered, must be more irritating than a liquid, but this is not the case, and sedatives and anodynes are specially useful for insufflation.

The effects produced by a cloud of dust falling on the mucous membrane will differ with the nature of the particles of which the dust is composed. An insoluble powder thus applied to healthy membrane provokes some irritation and an increase of secretion. The mucus thus thrown out envelopes it, and the whole is soon expectorated. If the powder fall on the cords more irritation and spasmodic cough are caused. Soluble powders will dissolve in the secretion, and running down the walls of the cavity, may cause cough at a later period, that is, on arriving at the glottis. Whether soluble or not, the powders may be astringent, sedative, stimulant, &c. And some influence is in every case to be attributed to the shock caused by the impact of the particles on the parts.

The bulb is thus covered with a thin coating of the caustic, and the instrument is ready for use. Instead of the bulb at the end, we may have depressions hollowed out on either side, into which the fused nitrate may be run; and other variations in the form of this simple instrument are occasionally serviceable. Besides only coating on one side of the instrument, we may secure still further protection by covering the other with a paste containing some table salt. Should then some of the nitrate left on one cord come into contact with the other, it will be decomposed by the salt that is left upon the sound cord, and the silver chloride will produce no effect. The holder should be cleansed and recharged after each occasion on which it has been used. One of the greatest advantages of this simple instrument is, that it is impossible for a piece of caustic to break off and drop into the larynx.

Nitrate of silver is so efficacious that the use of more potent caustics is seldom called for. They have, however, been employed. The caustic alkalies are not well adapted for use within the larynx, nor is the *potassa c̄ calce.* Objections also exist to su phate of copper and bichromate of potash, as solid caustics. In rare cases chromic acid has proved very valuable, but it is difficult to manage, and should only be used with the utmost caution.

Caustics may be used for various purposes. They are of the utmost value in certain cases of deep ulceration. They are frequently applied to the pedicle of a polypus which has been removed by instruments, and they are also successfully used for the removal of hypertrophy of limited extent, as well as for the destruction of morbid growths in the larynx.

Scarification.—In those cases of rapid œdema in which the patient is being suffocated, the laryngeal lancet is used to give exit to the fluid, and thus at once restore the power of breathing. The same instrument is also occasionally required to open an abscess, and it has been employed as a scarificator in certain other conditions arising in inflammation. It is, however, to be resorted to with reserve whenever there is not great urgency in the case. Various guarded lancets have been invented, the points of which can be pushed forward when they reach the spot, and which at once spring back within their sheath. My lancet, like my other laryngeal instruments, exhibited at the International Medical Congress in London, is forged from a single piece of steel, plated up to the blade. Such instruments give more power and precision. In skilled hands—and others ought never to touch them—they are not excessively dangerous.

Interstitial Injection.—By means of a small pointed syringe of a proper form fluids have been injected beneath the mucous membrane of the larynx, or into the substance of morbid growths in that organ. Some successful cases have been recorded; but since a patient died in Vienna a few minutes after the operation, it has been less frequently resorted to. It is a method of treatment I do not recommend.

Electrical Operations.—Faradisation of the larynx is often remarkably successful in restoring the voice. It is accomplished by means of a properly insulated electrode of the form of a laryngeal sound, which having been attached to the wire of one pole, is

carried into the larynx, the other pole having been previously applied to the neck, the circuit being completed by pressing the index finger on a spring. Only a small battery is required, and the result is often satisfactory.

The galvano-cautery may be employed in the larynx. This operation is one of great nicety, but has proved very successful.

One of the most delicate operations that can be undertaken is electrolysis within the larynx.

Either the intermittent or the constant current may, of course, be also employed for various diseases in the throat without the introduction of an electrode into the larynx. Those familiar with the clinical applications of electricity will find no difficulty in this; but, as it scarcely belongs to *laryngoscopal* therapeutics, it is unnecessary to say more of it in this place.

Removal of Growths.—Some account of the morbid growths which occur in the larynx will be found in a later chapter. In operations for the mechanical removal of such growths, various forms of forceps, guillotines, wire-loops, and *écraseurs,* have been employed; but having described these instruments in my "Laryngoscopy and Rhinoscopy," the reader who seeks further information on intra-laryngeal operations may be referred to that work. I therefore content myself with repeating my preference for simplicity in the construction of all instruments, which can only be regarded as supplementary to the fingers. Success depends not on the form of the instrument, but on the skill of the hand by which it is wielded.

CHAPTER IV.

CLASSIFICATION.

DISEASES may be classified in various ways to serve different purposes, and a number of terms are consequently employed in describing or designating them, which apply to sore throat as well as other affections. Examples are acute, sub-acute, chronic, in relation to time or severity; strumous, gouty, cachectic, in relation to diathesis; catarrhal, exanthematous, specific, in reference to cause. From what has preceded, it will also be seen that inflammation of the mucous membrane of the throat might be further classified according to its result. We might, for instance, arrange part of our subject somewhat after this fashion:

Inflammation of Mucous Membrane of Throat.

Acute ... ... as in inflamed sore throat.
Sub-acute or chronic ... as in relaxed sore throat.
Terminating in ulceration, as in ulcerated, follicular, aphthous, clergyman's, tuberculous, syphilitic sore throat, &c.
" gangrene, as in malignant sore throat.
" effusion, as in œdema uvulæ and œdema glottidis.
" suppuration, as in quinsy, abscess of the pharynx, &c.
" induration, as in enlarged tonsils and elongated uvula.
" exudation, as in croup and diphtheria.

As, however, disease is sometimes confined to a portion of the membrane, another division suggests itself according to its position, and that an exceedingly useful one in practice, especially as in this we may group together all the morbid processes affecting both the superficial and deeper structures of each organ. It may be exhibited in this manner:

Sore Throat.

Seated in the pharynx, as in pharyngitis, abscess, cancer, and aphtha.
" tonsils, as in tonsillitis, quinsy, hypertrophy, ulcer, &c.
" larynx, as in laryngitis, croup, cancer, hoarseness, aphonia, and other affections of the voice.
" glands, as in parotitis, &c.

Having already grouped the several forms of sore throat together, so as to exhibit their mutual relationship, we shall now, combining the two modes of classification presented above, proceed to describe the varieties of sore throat in detail. Thus, first we shall take inflammation and other morbid processes involving the several parts of the throat, and afterwards devote a chapter to the diseases of each of the several organs involved—soft palate, uvula, tonsils, pharynx, larynx, trachea, &c. The slight repetition occasioned by this will be amply repaid by the convenience of such an arrangement.

CHAPTER V.

INFLAMED SORE THROAT.

INFLAMED or inflammatory sore throat is a convenient term for an inflammation involving the entire faucial mucous membrane—uvula, velum, pharynx, pillars, tonsils, &c., all being implicated. When one organ bears the brunt of the attack, the others suffering in a minor degree only, it is better to call it tonsillitis, pharyngitis, &c., as the case may be, reserving the expression "inflamed sore throat" for the more diffused affection. In the former case the inflammation more frequently extends below the surface, is parenchymatous or phlegmonous; in the latter, the attack mostly has a catarrhal origin, and is preceded by sneezing, coryza, or lachrymation. As already shown, however, even when catarrh is the exciting cause, the throat may be the part first attacked. In the same way I have often known the catarrh begin still further down, and gradually extend upwards. Then, instead of coryza, sore throat, and bronchial catarrh succeeding each other, the order is reversed. The point first attacked is frequently recognised by the patient as his weak spot, the one which always

suffers with others, and usually before others, the *locus minoris resistentiæ.* Besides individual susceptibilities, we see others at work. Thus age has a great influence in determining the liability of parts to suffer, as witness the proneness of children to certain laryngeal affections.

As soon as the throat is attacked by catarrh, it becomes sensibly sore. It feels dry, or itching, or hot, or even painful. Swallowing aggravates the pain or uneasiness. Respiration is seldom impeded, except from the stuffiness occasioned by the accompanying coryza. On looking into the fauces, evidences of the congested state are seen—the marked redness and more or less swelling. Occasionally the sympathetic fever runs high. It is important, therefore, to remember that more serious ailments commence in a very similar way, and that this, manageable as it usually is, sometimes gives the attendant anxiety as well as trouble. The consequences of a single attack may be grave, while a repetition of sore throat frequently lays the foundation of lengthened suffering, and one attack predisposes to such repetition. Moreover, an inflamed sore throat, instead of being produced by catarrh or local irritation, may be only a local manifestation of another general disease. It is, therefore, needful carefully to weigh the circumstances before pronouncing a positive opinion as to the nature or treatment of any case. It must be provoking for a practitioner, who has jauntily assured a patient that he has only a common cold, to find on his next visit unmistakeable symptoms of scarlet fever. Besides, such an oversight would

inevitably shake the confidence which has been previously reposed in his skill.

When the diagnosis is determined, the chief point is not to overdose the patient. Confinement to the house for a day or two, or to bed even, with a milk or farinaceous diet may be advised; but anything more debilitating is unwise. No loss of blood, even by leeches, is required. If, in the course of the diffuse form, a single point, such, *e.g.*, as a tonsil, be attacked with phlegmonous inflammation, scarification of that part may occasionally be justifiable. Calomel, antimony, and other potent remedies, sometimes recommended on the score that the complaint is inflammatory, are best let alone: they weaken the patient, and prolong convalescence. In all probability, left to his own choice, the patient will regulate his diet with great propriety, choosing arrowroot, sago, tapioca, panada, gruel, or something equally innoxious and soft to the throat. At the same time, it does occur that a sore throat affords us a good excuse for reducing a patient who really requires this with another view than curing his cold. The inhalation of steam affords much comfort, especially in the early dry stage. It often seems, indeed, to arrest the disease; and when it does not, it hastens on the moist stage. Instead of the simple vapour, anodyne, or aromatic inhalations, or fumigations should be tried when there is considerable suffering. The act of inhalation encourages perspiration, which is an advantage. Fomentations, when there is pain, sometimes relieve. Gargling is painful in the acute stage. If the fever require it, a diaphoretic may be given, pre-

ceded or followed by a saline aperient. A combination of liq. ammon. acet. and spirit. ætheris nit., with, if the bronchi suffer, vin. ipecac., is very popular. In place of the last, antimonial wine is sometimes very efficacious; but the doses should be small. Of all internal medicines, however, aconite is the most universally beneficial. It acts on the local ailment as well as on the sympathetic fever. It cures without debilitating; nor is there any extra danger of ill-effects from a chill during its use.

Is it possible to cut short an attack of sore throat? In certain catarrhal cases, Yes, just as in coryza. A full dose of morphia or opium and belladonna at the very beginning will, in many patients, succeed, but not so often as in coryza. Many patients will tell us that the dose always stops a cold in the head, but not a sore throat. A free perspiration is equally efficacious, whether obtained from exercise, a Turkish bath, or diaphoretic drugs. "The dry method" is useless when the membrane of the throat is affected, though, for those who do not find the remedy worse than the disease, it succeeds in certain cases of inflammation of the pituitary membrane when profuse coryza is the chief symptom.

Phlegmonous inflammation, arising from several causes, is of common occurrence in the fauces. We then have a more serious disease, characterised, when the attack is severe, by greater urgency in the symptoms. In mild cases these resemble those of catarrhal sore throat; in the more severe we may have gangrene, and between these two we witness every phase. The phlegmonous inflammations, which are

secondary to other diseases, will come under notice in another chapter; but idiopathic cases occur, and may have a catarrhal origin. In phlegmonous sore throat there is usually higher fever, more pain, and greater swelling of the tissues, due chiefly to serous infiltration, and perhaps to dilatation of the lymphatics; yet the glands may not be perceptibly swollen; œdema is common; hæmorrhage also occurs, but less frequently, both these symptoms being more frequent in traumatic cases. Swallowing is often almost put a stop to, so painful does it become, and even the movements of the soft palate in talking cause so much pain as to impose silence on the sufferer. The tongue is coated with a thick fur, and often there is a copious discharge of mucus—perhaps tinged with blood—into the mouth. Headache, nausea, vomiting, and fever of various intensity will be present.

As to diagnosis, the chief point is to distinguish cases of primary inflammation from those connected with other disease, such as scarlet fever, glanders, &c. The treatment of idiopathic phlegmonous cases does not differ from the preceding variety of inflamed sore throat, except in so far as the urgency of the disease demands more active remedies, which, too, are varied, according to symptoms. Thus pain may call for anodynes and fomentations, though, at an earlier stage, ice to suck and cold compresses to the neck may be advisable. Some will use calomel and antimony, and these remedies seem more appropriate in the graver forms, but I have found aconite preferable. Constant warm anodyne inhalations are grateful and beneficial.

Traumatic cases are a variety of the phlegmonous caused by injury, and differ in degree from mere trivial lesions to those of a most deadly kind. Sometimes the throat is scratched by fish-bones accidentally swallowed. The dangerous custom some women have of holding pins and needles in their mouths leads to accidents of a like kind. Other substances taken into the mouth, even hard food or hot drinks, may give rise to various forms of injury. In still worse cases there is more severe and deeper inflammation; the mucous membrane may indeed be completely destroyed. Thus poor children attempt to drink from a kettle of boiling water, and are sadly scalded. This injury mostly involves the larynx, so that œdema of the glottis is to be expected, calling, perhaps, for laryngotomy. Doubtless this arises so often from some of the hot water being sucked into the air-passage by the effort to scream which instantly follows the pain. Another variety is caused by acids or other caustic liquids being swallowed, and in this the food-passage is the most constant sufferer. In attempted suicide, the liquid is usually completely swallowed, and the injury to the throat becomes of secondary importance. In accidents it is at once rejected, and the chief mischief happens to the mouth, epiglottis, and pharynx.

In all these cases prompt and appropriate treatment is needed. Our first indication is to neutralise the poison, stay its destructive action, and then to contend with the inflammation set up. In the mouth and fauces the nature and extent of the injury done can be seen, and the parts are within reach of our

remedies. This is also true as to the larynx. In the stomach we cannot determine the local damage. In the œsophagus, in cases that recover, the contraction that ensues often sets up stricture.

Injuries involving the external parts, accidental or intentional, such as cut throats and crushing of the larynx and trachea, though belonging to the province of surgery, demand notice in passing, as they bring on subsequent conditions which can only be determined by the aid of the laryngoscope.

ERYSIPELATOUS SORE THROAT. HOSPITAL SORE THROAT.

Erysipelas, as a rule, attacks the fauces only when it is also present on the cutaneous surface, though it may begin in the throat and extend to the larynx without any other manifestation of the disease. This fact, though sometimes denied, was known to Ryland. Sydenham describes erysipelas of the throat, and Hippocrates seems to have observed it. The disease may also chiefly affect the pharynx, but the tendency of erysipelas to spread is well known, and it usually involves several organs. Often it may be observed spreading from the skin, and sometimes it disappears in one place to appear in the other—a kind of metastasis, in fact, takes place. The junction of skin and mucous membrane seems a favourite spot with erysipelatous inflammation. Some sore throat is a common symptom also in erysipelas of the scalp.

There is then always some danger that erysipelas of the face may extend into the fauces and larynx.

In connection with the views insisted on in this work, and which I have taught for many years, it is interesting to find that M. Gallard* has recorded a case in which erysipelas was distinctly observed spreading from the throat along the lachrymal duct to the conjunctiva, and this has been confirmed by Rigal,† who saw a case in which the disease passed from the pharynx along the nasal passage and lachrymal duct to the face.

During the prevalence of erysipelas in hospitals cases are likely to occur in which the fauces are affected, and indeed this low form of diffuse inflammation may attack the attendants whenever the wards become foul. It is to this that the term "hospital sore throat" is so often applied, though the term is also used in respect to other conditions. In fact, any sore throat occurring in students, nurses, and others engaged in hospital work is apt to get the name which should be reserved for the graver disease.

In erysipelatous sore throat the congested fauces are dark in colour, and often seem drier—giving a purplish lustrous look to the parts. There is not necessarily much swelling. Vesicles sometimes form, but not often. The stinging heat or feeling of dryness is marked, and there are generally gastric symptoms and fever. Pseudo-membranous patches sometimes appear, and the glands of the neck swell. Gangrene may ensue.

* *Gazette des Hôpitaux*, 1869, p. 47.

† *Ibid*, 1869, p. 20.

The danger of erysipelas in the throat is lest it should involve the larynx. As soon as it does so the swelling of the parts exposes the patient to imminent suffocation. In fact, all the symptoms of laryngeal œdema occur, and the course of the disease is generally rapid, calling for immediate scarification; even when carefully done this is not always effectual, and laryngotomy becomes the only resource. Erysipelas happily does not always extend to the larynx, and when it does the attack is not always so severe. It may give rise only to sub-acute laryngitis without œdema, or without sufficient swelling to seriously impede inspiration; but in the mildest cases the patient should be watched and assiduously treated.

Until the obstruction to the air-passage becomes urgent, the best local remedies are constant inhalations of a soothing character. Sometimes it may also be desirable to apply nitrate of silver to the mucous membrane of the fauces and larynx—more frequently the former. It should therefore be tried there, and the effect observed. If beneficial, it should be carefully applied within the larynx. General treatment should be carried out with energy; as in erysipelas affecting other parts, the patient must be supported by nutriment frequently given, and large doses of quinine and solution of perchloride of iron administered. If gangrene occur antiseptic application will be required.

RELAXED SORE THROAT.

Chronic Inflammation may follow the acute attack,

or it may arise only as such, or at most in the subacute form. If this be suffered to continue without treatment it is liable to bring about the condition called relaxed sore throat. This last term is in everyday use to express different things. One means by it any of the forms of chronic inflammation, another intends merely a susceptibility to catarrhal attacks. It is better to restrict it to slight relaxed states consequent on repeated attacks or to chronic inflammation. Here we have no feverishness, and the local symptoms are much milder, though not more tractable. The congestion is passive. Instead of intense redness, the membrane is often paler than usual. Relaxation is, in fact, the state with which we are brought into contact.

Our treatment is more various and difficult, though for the most part it is local. If there be much irritability, with dryness of the surface and an approach to congestion, the soothing effects of inhaling steam should be tried as a preliminary to other measures, especially in the early stage. It will often, however, merely supply moisture, the nervous irritation only yielding to a dose or two of aconite. As the local effect of this drug is as marked as the constitutional, and in these cases more so, it should be obtained. This may be done by getting the patient to gargle a moment with the mixture before swallowing it, or the medicine may be given in powders or lozenges, or a gargle too strong to swallow may be used, or the throat be painted with the tincture diluted with glycerine. When the mildest possible stimulant is needed to get rid of the relaxation, astringent or

stimulating lozenges or jujubes are both pleasant and effectual. Black-currant jelly enjoys a popular reputation, which it well deserves; for it is a mild astringent, and one of the most agreeable that can be suggested. The gargle is a more effectual application when a stronger agent is desirable; but as the liquid is not brought into contact with the whole surface, its value is most manifest in cases in which the anterior part of the velum, uvula, and pillars are inflamed. Lozenges medicate the surface during the act of deglutition. Far more effectual, however, than these is the application of medicated sprays. The modifications I have made in the apparatus make my atomiser so simple and so inexpensive, that this method of treatment is now within the reach of all subjects of relaxed throat. Any of the numerous forms of chronic or sub-acute inflammation may not only be treated for a time with it, but it may be used as a tonic to the mucous membrane. I have also had tubes fitted to the instrument for applying the spray to the anterior or posterior nares, or, in fact, any part of the surface, in the same way as the pharyngeal or nasal douche. The atomiser and the douches may be used by either patient or physician. The latter may have to resort to still more powerful methods. By means of the throat probang or camel-hair brushes, or in other modes already described, it may be necessary to apply remedies to more or less extensive portions of the mucous membrane. This is an operation the delicacy of which depends on the part to be touched, but in all cases it must be performed by the physician himself. How frequently it may have to be repeated

depends on the condition of the parts and the chronicity of the case. There is a tendency to resort to it oftener than need be, and to neglect intermediate treatment. The regular use of the atomiser greatly lessens the need for these more powerful local applications.

CONSTITUTIONAL VARIETIES—SCROFULOUS, TUBERCULAR, RHEUMATIC, GOUTY, SYPHILITIC, DIABETIC SORE THROAT.

Difference of diathesis gives rise to certain variations in the course of inflamed and relaxed sore throat. Such cases should be discriminated, and the patient treated accordingly. Local applications, although of value, will be found less efficacious than in simple inflammatory processes. Their influence is also temporary, so that we can only permanently benefit our patients by a course of treatment—dietetic, regimenal, and medicinal—adapted to their constitutions. Some of these varieties may be specified.

In strumous constitutions, an inflamed or relaxed state of the mucous membrane of the throat is very frequent and apt to prove obstinate. There is the same want of intensity, the same sluggishness which the inflammatory process generally presents in the scrofulous diathesis. Not only does the affection tend to become chronic, but it is liable at intervals to take on a sub-acute form, and a succession of these attacks may lead to more serious lesions. Even when they are entirely removed there is a special liability to

return, and it is in such patients that scrofulous ulcers have been observed to develope in the throat. Local treatment alone is then of little use; it may, indeed, remove the temporary inconvenience, but not the tendency to a recurrence. It is therefore important to distinguish these from the catarrhal cases of sound constitutions, and direct our treatment to the diathesis. It is the patient more than the part that needs treatment.

In phthisical persons we notice the same tendency to repeated attacks, but often there is more temporary intensity of inflammation, and less disposition to chronic congestion between them. In fact, anæmia of some parts is more commonly seen in the earliest stages of phthisis, but the tenderness of the membrane predisposes to congestive attacks, and it is quite probable these may lead to other changes to which the name tubercular sore throat may be more properly applied. The cases we are distinguishing here belong to an early period of consumption, and are therefore more likely to come within the range of preventive treatment.

Rheumatic persons are also liable to suffer from recurring attacks of sore throat, and a more active chronic congestion is in them more common than in the preceding varieties. The recurrence of the subacute or even acute attacks is greatly influenced by the weather, and rheumatic patients of this kind are much more sensitive to atmospheric changes than the scrofulous or consumptive. There is also another form of sore throat to which the name of rheumatic has been given, one in which the angina seems to alternate

with muscular or articular rheumatism. This is a more acute affection, and pain is a prominent symptom. There is considerable swelling, and a congested state similar to that seen in scarlatina, with dysphagia, pain in the neck aggravated by moving the head, and rather high fever. These symptons may disappear suddenly as rheumatism appears in another part. In the most acute condition, fomentations and inhalations may relieve the pain. A large sponge wrung out of hot water, and applied as hot as it can be borne, is a convenient application, or hot flannel may be placed all round the neck; sometimes it may be a question whether cold compresses should not be applied and ice sucked. But any of these are mere measures for temporary relief, and it is most desirable not to lose sight of the rheumatic character of the disease. The patient should be brought under the influence of the salicyls. Guaiacum is thought by many to relieve acute rheumatic cases. In the more chronic forms, or the recurrent, iodide of potassium will often afford speedy relief, and its careful use may be of lasting value. On the other hand, this drug occasionally seems to produce a sub-acute cynanche; that it produces coryza is well known, and, for this reason, some persons are unable to take it; we need not be surprised, then, that its effect may sometimes fall on the other portion of the mucous membrane. It may be well to mention, however, that the coryza or cynanche occasioned by this drug may be readily controlled by morphine. A single dose of this anodyne will frequently arrest the catarrh caused by the iodide, which may be resumed in a day or two, if needful. I have

used the iodides of sodium, lithium, and calcium, with good effect, and the salicylates of these metals are also valuable additions to our materia medica. It is often desirable to follow up salicylism with a course of quinine or such other tonic as may seem more indicated. Other measures for the management of rheumatic patients will suggest themselves to the reader. The great point is to discriminate the cases.

Gouty people are also prone to suffer from chronic inflammatory or congestive sore throat, which is greatly aggravated at intervals. It is generally recognised that the bronchial mucous membrane is disposed to take on inflammatory action in gouty people, and that to treat the bronchitis without reference to the diathesis is futile. So retrocedent gout is known to affect the bronchi. It might, therefore, be presumed that the other portions of the respiratory mucous tract may equally be the seat of a metastasis. But acute gout in the throat must be rare, though the chronic affection I have described may often be met with. The intercurrent sub-acute attacks are not so much influenced by weather as by dietetic errors. Some local measures for relieving the patient may have to be tried; and between the attacks it is also desirable to persevere in such applications as will give tone to the membrane, but suitable general treatment should be at the same time precribed.

In syphilitic patients we may have only an inflamed or relaxed sore throat as a prelude, unless properly treated, of most destructive changes; but this disease will be treated further on.

Diabetic patients sometimes have a chronic relaxed

sore throat with a sweetish taste in the mouth, which induced Gibb to speak of "saccharine throat" as a new disease. He thought follicular sore throat essential to this, but that is evidently not the case. Some think follicular disease is itself constitutional, but it is unnecessary to allude to it here, or to other varieties of sore throat dependant on diathesis.

CHAPTER VI.

ULCERATED SORE THROAT.

THIS term is often applied indifferently to any case of sore throat in which the process of ulceration has taken place. This indefinite mode of expression is apt to lead to confusion, inasmuch as it associates cases which are most unlike each other. Thus ulceration is a frequent occurrence in the specific forms of sore throat. Then there are some cases of aphthous ulcers, as they are called, which will occupy us in another chapter. At present we have to remember that erosions or ulcers may appear on any part of the throat; the significance of their presence varying with the part in which they appear, the condition which has preceded, their number, size, cause, and course. First, as to the most simple form.

Erosion or ulceration, following inflammatory sore throat gives rise to most of the symptoms of the relaxed form. The painful deglutition may not be well marked, but the hawking or coughing up of the secretion which accumulates, in consequence of the local irritation, is often distressing. Inspection dis-

plays the solution of continuity, large or small; it may be a mere breach of surface, or a deep, round, definite ulcer of any size. Acute cases, sometimes seem to be septic, are set up by exposure to the exanthemata or to foul drains, or form a variety of hospital sore throat. Chronic cases which have for a long time passed as a relaxed sore throat, and have been treated as such, may be found, on careful examination, to be ulcerated. A hasty glance may not reveal this state, but if every care be taken to obtain a good view it will be detected. A mere glimpse of the fauces will not suffice, as ulcers may be situated where it is impossible to see them without artificial aid. A good light can be obtained by a reflector, and in children my speculum will assist, but the faucial mirror must be employed, as in laryngoscopy and rhinoscopy, before we can form a trustworthy diagnosis. No one would venture to diagnose ulcer of the larynx without a laryngoscopical examination, and yet it is too often forgotten that the same method of illuminating other parts may be just as serviceable. In the upper part of the pharynx, in the posterior nares, the mirror will enable us to see such changes as may have taken place, and to apply such remedies as may be indicated. Rhinoscopy, though less practised by many, is as important as laryngoscopy. To know the disease is often half the cure. The dexterous use of reflected light enables us both to see and treat it, as I have often had occasion to demonstrate.

Ulcerated sore throat is generally seen in cachectic patients. This cachexia may be either constitutional or acquired. We have seen how certain diathetic

conditions give rise to inflammatory sore throat, and some of such cases are apt to terminate in ulceration.

Tuberculous cases are perhaps less rare in the fauces than has been supposed. In advanced consumption we find tuberculous infiltration of the mucous membrane and sub-mucous tissue bringing on ulceration, which is not usually extensive or deep. Small ulcers form, and when near each other may coalesce. In the pharynx they are apt to be larger and deeper, and the muscles may be infiltrated with tubercle. In the larynx, we not only see the disease at an earlier stage, but more frequently have an opportunity to watch it; it will be considered at length further on, as a phase of laryngeal phthisis.

Scrofulous ulceration takes place in several parts, and the destruction of tissue which occurs is greater than in tuberculous. It is likely to be confounded with syphilis. Some, indeed, have attributed to that disease all the cases recorded as scrofulous ulceration. I admit, however, with Hamilton, Fougère, and Isambert, the existence of strumous ulceration, and although the disease is rare it deserves to be distinguished. Moreover, it is not improbable that if this disease has been confounded with syphilis, some cases of the latter have been supposed to be scrofulous. The fact that some treatment may be appropriate for both diseases has, perhaps, perpetuated the indisposition to discriminate them. Mercury will only aggravate scrofula, though this is true of some cases of syphilis also. Iodine or its salts are indicated, and cod-liver oil. Iodoform both locally and internally is the most valuable remedy.

As we may have in the throat scrofulous, tuberculous and syphilitic ulcerations which are not to be distinguished without great care, so in the nasal cavity the same may occur. Tuberculous ulceration of the nose is, however, so rare as to be almost unknown, while scrofulous ulcers are tolerably frequent. They give rise to one form of ozæna. They may penetrate deeply into the tissues, and are then likely to be mistaken for syphilis. This may not be familiar to all, but it is certain that even injury to bone is not sufficient to enable us to positively assert that syphilis is the cause. In the nose, too, foreign bodies have been discovered by the rhinoscope as the source of ozæna when syphilis had been positively diagnosed.

Lupus of the throat is usually seen simultaneously with its appearance on the nose or face, but sometimes it invades the throat first. It may cicatrise without great loss of substance, or it may give rise to extensive destruction of tissue, followed by contractions or adhesions. In the larynx lupus is not so common, but it is more frequent than many imagine.

Herpetic ulcers should also be discriminated. Their history, or the co-existence of catarrh, often slight feverishness, will assist the diagnosis. Their appearance, too, is generally less indolent; in fact, they look irritable, as they are, and suggest soothing inhalations, which are appropriate. They come in clusters, and may occupy the pharynx, pillars, tonsils, velum, &c., but are most common on the roof of the mouth, Little ulcers similar to these often occur on the tongue.

The *treatment* of ulcerated sore throat must vary

with its nature. In acute cases it will sometimes be necessary to adopt the most active measures; especially is this the case in sloughing ulcers, or in rapidly spreading syphilitic ulceration. In such cases the rapidity with which important structures may be destroyed makes it desirable not to lose a moment in bringing the most potent agents into play in order to avert the progress of the disease. In the most urgent cases, nitric acid or acid nitrate of mercury should be applied, and active general treatment pushed with vigour. In less urgent cases milder applications, such as nitrate of silver may suffice. After the action of the caustic, soothing inhalations will comfort the patient.

Chronic ulceration requires a course of treatment general and local, of the most varied kind, according to the variations of the case. If there be much irritability, anodyne inhalation may be the first measure, and this will often cure herpes, in which all irritants should be avoided, as they only aggravate the patient's sufferings. In other chronic forms, a topical stimulant may be needful. Solution of nitrate of silver is perhaps the most commonly used, but other substances—astringent, stimulant, or escharotic—are often preferable. The applications may be made with brushes, probangs, or cotton wool, according to the position of the ulcer. If few and large, it will be better to make the application to the ulcers only, and solid substances may be best for this purpose. If, for any reason, it be undesirable for a time to employ such treatment, fumigations of iodine, and occasionally of mercury, will be found very

valuable, and in other cases a resort to them, between the use of caustic, will materially hasten the cure. But important as is topical treatment, other indications must not be overlooked. It is true, the ulcers may be healed over by local appliances, and the sore throat called cured; but there will be a great disposition to a return, and the patient is really little better for his cure. He may suffer less annoyance, he may fancy himself well; but he carries about a constitutional taint, which may on the slightest exposure renew all his symptoms, or put a period to his existence by inducing consumption or some allied disease. Of course the general treatment will vary with the prescriber's opinion of the constitution he has to deal with. A mistake here will frustate all his intentions, and disappoint all his hopes. Often, too, every form of tonic he may think suitable will prove vain unless he prepare the system to receive them. Not only so, the patient will declare, and quite truthfully, that all his medicines "disagree;" mischief rather than benefit, will accrue.

CHAPTER VII.

GRANULAR OR FOLLICULAR SORE THROAT. CLERGYMAN'S SORE THROAT.

INFLAMMATION often seems to affect most the lacunæ or crypts, and sometimes it is confined to them from the beginning. These follicles appear to take on a low form of inflammation; they gradually enlarge, become distinct red points, and in course of time ulcerate. But the progress of the disease is exceedingly slow; the follicles may remain for months or years inflamed and hypertrophied before actual ulceration occurs. All this time the intervening membrane may be scarcely affected, generally it is relaxed, or a state of congestion of a venous character gives it a dark, unhealthy look, or the congestion may be more active, or erosion may take place over the surface. Thus we may have all the varied appearances dependant on chronic inflammation and its consequences.

This, commonly called clergyman's sore throat or *vox clericorum*, is the follicular disease of the late Dr. Horace Green, who devoted a volume* to its elucida-

* *Op. cit.*

tion, and the *angine granuleuse* or *glanduleuse* of Chomel and other French writers, who attributed it to herpetism. We employ the word herpes in quite a different sense, and in this volume I have carefully discriminated between herpetic and follicular disease. To the praiseworthy zeal of Dr. Green, who bestowed almost unlimited labour on the subject, we are indebted for the first elaborate description of follicular disease in the several portions of the membrane. In devoting himself exclusively to the pathology of the follicles, he seems almost to ignore the rest of the surface. Without for a moment wishing to disparage his labours, the author thinks it right to state that experience teaches us that the intervening membrane frequently is primarily attacked with inflammation, which involves the follicles secondarily — a lesson in pathology which anatomy and physiology might have taught us *à priori* to expect. French writers assign the merit of first teaching the nature of follicular disease to Chomel, who, according to Noel de Mussy,* was accustomed to describe it in his clinique for several years before Dr. Green. He also seems to have published† an account of it some six months before Dr. Green. As those were not the days of rapid communication like these, the American physician could not have been indebted to the work of the Frenchman, but we must award them equal praise for having worked out the subject independently of each other.

* "Traité de l'angine glanduleuse." Paris, 1846.
† *Gazette Médicale de Paris*, 1846.

Granular or follicular sore throat being only the result of inflammation of the follicles, may attack any part of the membrane where such recesses exist. It is most common in the pharynx, especially on the posterior wall, but often seen also on other portions of the faucial membrane. It is not so frequent in the larynx, and some—as Dr. Mandl—do not admit that it attacks that organ. On the other hand, Reinhard describes it as common in the bronchi, and says he has seen it on the minuteest ramifications when surrounded by tubercularised lung tissue, and he thinks that disintegration of tuberculous lungs proceeds from this kind of ulceration destroying the walls of the bronchus. Niemeyer endorses this view, so far as regards caseous pneumonia. Green describes the disease as extending not only to the bronchi, but to the œsophagus as well. I see no reason why it should not attack any part provided with follicles. All admit that it is most common in the pharynx, the posterior wall of which is very apt to exhibit this disease. It generally begins there; only rarely will it commence on the soft palate or uvula. More frequently it occurs on the upper pharynx, but there we require the rhinoscope to see it. It may seem to take its start from an ordinary inflamed sore throat—acute or chronic—or it may arise independently. It is also apt to appear in the course of other diseases of the respiratory mucous membrane, from which circumstance no doubt arose the supposition that follicular sore throat is a disease intimately associated with consumption.

I have described follicular inflammation as chronic,

because this form is so frequent that authors have scarcely noticed any other. It is right to add, however, that I recognise acute folliculitis, and sub-acute cases are scarcely rare. The morbid process proceeds more rapidly in acute cases. In place of indolent hypertrophy we often see suppuration. The small abscesses thus formed leave ulcers behind, and such cases, unless recognised and properly treated from the first are apt to prove very obstinate. Even when ulceration is prevented by timely treatment, the acute is liable to end in the chronic form, hypertrophy of the follicles remaining. As long as this lingers sub-acute attacks are likely to occur, each one aggravating the case; therefore our utmost efforts must be directed to re-establish a healthy condition of the follicles and give tone to the intervening membrane, so as to prevent the case degenerating into the more tedious disease.

The diagnosis is easy; we have only to look into the fauces and see the prominent follicles—red and angry-looking, or paler, or yellowish, according to the contents of the enlarged follicles, which may be mucous or purulent. The intervening membrane may be nearly healthy, or display the signs of inflammation and its results. It is no uncommon thing to see enlarged vessels coursing over the surface, which may be either clogged with viscid secretion, or preternaturally dry. In other cases the whole membrane appears to be in a state of intense active congestion. In others again it is deprived of its epithelium and the surface resembles raw-beef with numerous prominent points upon it. These may be, in some stages, of

a deeper colour—more commonly they appear paler, or whitish, or yellowish: They are, in fact, little pustules formed by suppuration of the inflamed follicles. Some of the appearances are well seen in plate I., fig. 1.

The symptoms vary greatly. The patient may suffer no inconvenience, and the disease be discovered by accident. On the other hand, he may be so distressed that his life may seem a burden. Between these extremes we have every variety. Generally, at the beginning a sensation of dryness or tickling is present, or there is a constant desire to "clear-up," to hem, or even to cough, occasioned by a feeling as if a particle of secretion were lodged, and required an effort to get rid of. From the persistence of the sensation the patient may acquire the habit of frequently clearing up before he is aware of it. Preachers are prone to this, and often the habit becomes established, to the discomfort of the congregation. In private life, too, a constant hemming may make a man a nuisance to his friends before he seeks advice. There may be very little expectoration, and scarcely any cough, but the patient is susceptible to atmospheric influences, and every fresh catarrh increases his troubles, as it involves fresh follicles. Sometimes, however, there is more expectoration, and this may be tinged with blood and alarm the patient. The voice is usually altered in tone, its purity lost, and its use becomes fatiguing. These points are marked in public singers, teachers, and others who use the voice much, but where that is not the case, may be overlooked, or the patient will attribute his state

to repeated attacks of hoarseness, the voice being more affected each time he takes a cold. There is no doubt that the constant "hemming" irritates the mucous membrane, and aggravates the case.

Seeing how different are the conditions comprised under the term follicular sore throat, it is not surprising that the remedies required are very various, and that those most useful in one case may be injurious in another. While we must modify our measures with the constitution of the patient, we must not neglect the distinct local lesion, even though it may be limited in extent, and in an early stage. Some physicians try to trust entirely to general treatment, others send their patients to a warm climate. Continental writers generally advocate mineral waters, especially those containing sulphur. It is not to be denied that many diseases may be shaken off when the patient is placed in the most favourable hygienic conditions, for which reason no doubt relief is often obtained in this way, but it is seldom either complete or permanent. After the local disease has been cured the patient may be greatly invigorated by a visit to a suitable health-resort. Alterative, tonic, or other appropriate remedies, according to the indications, should be employed while the local lesion is being subjected to suitable topical treatment. This may embrace any of the measures recommended in inflamed, relaxed, or ulcerated sore throat, the selection depending on the condition of the membrane at the time. In the early stage the disease will be found under this plan more tractable than is generally supposed, but relapses are apt to occur, and therefore

preventive measures should be enjoined on convalescents.

Chlorate of potash, chloride of ammonium, bromide of potassium, the permanganates and many other substances may be employed in various forms—the best perhaps being in spray. The persistent use of the atomiser will, in fact, if the solution be judiciously selected, lengthen the intervals at which it is necessary to have recourse to stronger remedies.

If the follicles continue to enlarge in spite of milder remedies, or if there be much granulation, perchloride of iron may be tried, and a solution of this salt as a spray is useful in other cases. If general hypertrophy or thickening have taken place, painting with iodine may be tried; solution in glycerine is preferable to the tincture. Iodoform in fine powder can be applied with the insufflator, or an etherial solution with a brush, or a spray may be used.

Hypertrophied follicles will disappear under the persistent use of judiciously regulated treatment, and ulceration may be removed, though it often leads to ulterior changes. Horace Green and others have relied almost exclusively on nitrate of silver, and few agents have so wide a range of action, but its indiscriminate use is to be deprecated. The effect varies with the strength. According to the indication it was intended to fulfil, and the condition of the part to which it was to be applied, I have employed solutions from 2 grs. to 60, and sometimes 120 to the oz. The solid salt, fused on the end of a probe, may be used to touch individual follicles or ulcers.

Strong caustics have been used in the same way,

but it is to be feared have done more harm than good. At any rate, they should only be used with great circumspection. To destroy tissue the galvano-cautery as used by Carl Michel, and the actual cautery, again proposed by the late Dr. Foulis,* may be resorted to, but I have not often found that destruction of tissue is desirable. Still less frequently would it be right to pass a cautery knife over the surface, as recommended by Riesenfeld.† It may sometimes be of use to scarify individual granulations, or to open small pustules, but this is not often the case.

* *Glasgow Medical Journal*; October, 1877.
† *Lancet*, August 11, 1877.

CHAPTER VIII.

APHTHOUS SORE THROAT. MOUTH AFFECTIONS.

THE conditions which have been grouped together under the general name "aphtha" bear an intimate relation to our subject, since not only may they involve the throat, but they form the connecting-link between its diseases and those of the mouth. The several kinds of stomatitis so common in children, are the exact counterparts of forms of sore throat originating in inflammation; and the one may therefore be made serviceable in explaining the other. The simple catarrhal form of inflammation of the mucous membrane of the mouth is not uncommon, and sometimes we see inflammation in this cavity put on the distinctly follicular form which has been described in connection with the throat: hence follicular cynanche has been called aphthous sore throat; but inasmuch as the word aphtha has been used in other senses, it is better not to apply it thus, but to distinguish this disease in the mouth as follicular stomatitis. When a crypt has suppurated, it presents just the same round ulcer, with all its varieties in appearance; and the treatment will be conducted on the same principles, whether the disease be in the mouth or throat.

Ulceration in the mouth is more often aphthous than follicular; we see it involve considerable portions of the mucous membrane, both in children and adults, most frequently in the form of numerous small ulcers, more or less inflammation occupying the surface between. Thus it would appear as if the ulceration were but a stage or result of catarrhal inflammation, but in other cases the latter process can scarcely be said to exist. It has indeed been denied, but perhaps the slightest degree has been overlooked. After some premonitory inflammation, or even before complaint of this has been made, little white patches surrounded by a red margin appear. They look like specks of exudation, which some suppose them to be. They have been spoken of as vesicles, but should be distinguished from them. These aphthæ, as they are called, produce erosion, which may soon heal over or leave deeper ulceration. A more serious aphthous ulcer is seen at the junction of the hard with the soft palate. Here slight congestion is soon followed by ulceration, which, though usually superficial, sometimes penetrates to the bone, and in either case is apt to prove obstinate, often continuing until death. These cases are most frequently seen in foundling and lying-in hospitals. The effect of mercury in the mouth seems to be produced by a process analogous to that which gives rise to aphtha, and the same may be said of idiopathic stomacace.

Sloughing may come on in these forms of aphtha, but is not often seen in sound constitutions. Gangrene may occur in the mouth as well as in the throat, but care should be taken not to confound with either

sloughs or gangrene, aphthous ulcers, on which blood has been effused and decomposed.

The treatment of aphthous sore throat is similar in principle to that of the same disease in the mouth. In mild cases cleanliness and the use of a weak akaline and antiseptic mouth-wash and gargle, may suffice, *e.g.*, permanganate or chlorate of potassium or borate or chlorate of sodium. In severe cases where ulceration has occurred, the aphthæ are to be treated locally according to the indications, and the chlorate is to be freely administered internally. In mercurial stomatitis and in idiopathic stomacace 5 to 10 grains every three or two hours, or even more frequently, will soon overcome the fœtor and produce a favourable local change. A child of two years of age may consume 20 or 30 grains daily properly diluted and at frequent intervals. It may relax the bowels, but that will do no harm. In follicular ulceration, or when ulcers succeeding aphthous specks seem to get sluggish, a mild stimulant may be required, such as a weak solution of nitrate of silver, and occasionally it may be as well to touch an ulcer or two with the solid substance, but these ulcers are seldom indolent; they are usually irritable, and such treatment is painful. Under the timely use of the chlorate aphthæ generally only produce erosion, and the epithelium is rapidly replaced. This fact should deter us from one of the prevailing errors—over-treatment of a topical kind. It is positively cruel to be too energetic with roughly-applied irritants, and yet this is daily seen. Nurses, and mothers too, rub the tender and inflamed membrane of infancy with borax and honey—a practice which

few adults would suffer to be perpetrated on them; and all most unnecessarily, and for the most part mischievously. If stimulants be needed, there are others which are far better. In infants, careful management of the diet is all-powerful, and the local means must be the simplest—such as ablution and the remedies mentioned. A mucilaginous decoction, with some chloride of lime, is highly prized by M. Guersant,* who uses this remedy also in enemata in preference to limewater, and topically instead of solutions of borax, or zinc, or alum.

Sloughing ulcer and gangrene following aphthæ, of course, require the most energetic treatment, both local and general. With every attention, they prove very fatal.† They should be distinguished from *noma*, a form of gangrene in the mouth which appears to come on without any inflammation preceding it. It attacks the inside of the cheek, which it often rapidly perforates. Rare in England, but more common in France and Holland, it is from French and Dutch observers we derive the best descriptions of it; Isnard is very graphic.‡ It is mostly observed as an occasional sequel to the exanthemata; in strumous children it is often accompanied by a very serious gastro-enteritis. In lieu of chemical caustics, M. Baron § makes a crucial incision on the external surface of the cheek, and through this opening applies a wire at a white heat.

* "Dict. de Médicine," Muguet.

† Billard, "Traité des Maladies des Enfans."

‡ "Dissertation sur une affection gangréneuse particulière aux enfans."

§ "Mém. sur une affection gangréneuse de la bouche," 'Bulletin de la Faculté,' 1816.

CHAPTER IX.

FUNGOUS SORE THROAT. THRUSH.

ANOTHER most interesting disease in reference to our subject is also more common in the mouth, and chiefly affects children. This is thrush or millet, the *muguet* of the French, the *soor* of the Germans. It is essentially a parasitic disease, depending on the growth of the *oïdium albicans*, and should be distinguished carefully from aphtha, although that name has often been given to it. So aphthæ have been called thrush, but it would be well to confine the word to this parasitic disease. Even this, however, often begins as a slight catarrhal inflammation of the mucous membrane, or there may be only slight congestion, or scarcely perceptible hyperæmia. It may indeed be impossible to state more than that there is unusual dryness or a trifling soreness. When the mouth is parched and hot, either in early infancy or in adult patients who are sinking from chronic exhausting diseases, we may anticipate that the membrane is about to be invaded by the *oïdium albicans*. There is always some deviation from the healthy condition of the membrane

before the parasite appears—and the secretions of the mouth always give an acid reaction. Probably the fungus does not find a suitable nidus or appropriate nutriment in the ordinary moist membranes of health, besides which, it may be removed too readily to allow it to grow.

After the dryness and soreness have lasted an indefinite time small white points or patches appear on the membrane. These spread and coalesce until in severe cases a complete creamy deposit covers the mucous membrane. The deposit comes off in due time, and leaves the part beneath inflamed or perhaps eroded. Professor Berg* first proved the constant existence of this cryptogamic vegetation in the deposit. Whether the parasite constituted the disease, or was merely developed in a sort of exudation caused by inflammation, was long in dispute, but it is now generally admitted that parasitic thrush is a distinct disease dependent on the presence of the *oïdium albicans*—a kind of fungus which grows very rapidly in depraved secretion of an acid reaction or even on preternaturally dry mucous membrane. The development of the fungus is also greatly favoured by decomposing food, especially milk and sugar.

It is not surprising that muguet is infectious, as proved by M. Berg, who transplanted the sporules of the fungus to healthy mucous membrane, thereby communicating the disease, an experiment repeated by others—and in a sense, often carried out on a

* "Ueber die Schwämmchen der Kinder."

large scale in foundling institutions, where nurses are negligent as to cleanliness, and the promiscuous use of cups and feeding bottles, and, above all, india-rubber teats propagates the disease.

It is easy to understand from what has preceded why this fungus should find its first lodgment in the mouth. But now and then it begins in the throat. It spreads in all directions over the squamous mucous membrane, on which alone it appears to thrive. Hence in aggravated cases, though it does not descend into the larynx, it covers the whole pharynx and œsophagus as well as the mouth, with a thick white deposit, which may acquire a yellow colour, or may be stained with blood. The deposit may resemble a false membrane but on microscopic examination will be found almost entirely composed of the sporules of *oïdium albicans*, or these may be mixed with depraved secretion, or with epithelium. In severe cases there is gastro-intestinal derangement; constant diarrhœa, the stools being acid in reaction, green, and offensive. Under this the child soon wastes away. It used to be thought that this was due to the disease occupying the stomach and bowels; but although it appears sometimes at the anus, the *oïdium*, as we have said, only thrives on squamous epithelium, and therefore cannot extend beyond the œsophagus—which it sometimes quite fills. It is for the same reason that thrush does not invade the nose. Of course large quantities may be swallowed, and therefore be found in the stomach, but that is very different from being formed there.

The statements made respecting the nature of thrush, and the fact that it is a disease of the first

weeks of infancy, or which attacks adults towards the close of exhausting diseases, go far to establish a rational mode of treatment. The first thing is to keep the mouth clean, and in infants this will suffice. If the baby be allowed to go to sleep as it is fed, the milk remaining in its mouth supplies fresh nourishment for the fungus. If the mouth be gently washed with water or a very feeble alkaline lotion, or a weak solution of permanganate, the fungus will soon disappear, and the mucous membrane put on a healthy appearance. I have repeated (p. 175) my old protest against borax and honey. It is true that in these cases the borax would be useful alone, because of its alkaline reaction, but the saccharine element favours the development of the *oïdium*, and should therefore be avoided, as I argued twenty-five years ago. A solution of this salt, or better still, of carbonate of soda or potash—from 10 to 20 grains to the ounce—is a much better preparation. If the bowels become loose, lime water—not the saccharated—should be given. In severe cases, where the enteric complication has begun, it is a common practice to apply a solution of nitrate of silver, sometimes the solid substance, to the part of the diseased membrane which is accessible. The value of the practice is by no means commensurate with its frequency—is perhaps altogether doubtful. It would be more rational to increase the strength of the alkaline washes or use chlorate of potash. But, indeed, whenever spoon-fed children are thus attacked, the one remedy is a healthy wet nurse. When this can be obtained even desperate cases, carefully managed, will soon recover. The natural food and absolute

cleanliness, and the avoidance of sugar and anything likely to undergo acid fermentation, will snatch many a child from the brink of the grave.

The measures advised for infants will also be a comfort to those dying invalids who are troubled with thrush. They will often be able to wash the mouth and gargle, even when both are sore. As soon as dryness or soreness is complained of, it is well to begin this treatment as a preventive, and lime water, chalk mixture, or other alkaline remedies may be required.

CHAPTER X.

CROUP AND DIPHTHERIA. EXUDATIVE SORE THROAT.

WE have now arrived at the exudative form of sore throat, some features of which have already been described. In the mildest cases a few flakes form on the fauces, without giving rise to very serious consequences; but such instances are exceptions, and the presence of a single flake must be regarded as of grave import, for this exudation is the characteristic of the two serious and fatal diseases treated of in this chapter. In croup, the exudation endangers life, both by inducing spasmodic closure of the glottis, and by mechanically impeding the entrance of air into the lungs; the patient dies suffocated: in diphtheria it is associated with intense depression of the vital powers, such as we see in malignant fevers, and speaks plainly of blood-poisoning; the patient dies exhausted. These distinctions are sufficiently marked in typical cases; but in others, as already shown (p. 41—46), there is a tendency for each group to run into the other, and

no doubt this it is which has given rise to the numerous discussions as to the identity or non-identity of the two forms of exudative disease.

The belief that croup is but a form of diphtheria, though not generally accepted in Germany and England, has long been a common tenet in France, and as such, must be familiar to every one conversant with French medical literature. Even in this country it is no new doctrine, for, five-and-twenty years ago, in the first edition of this work, as in the present, croup and diphtheria were grouped together under the head of exudative sore throat, in accordance with which, it was stated that "both are alike the manifestations of an inflammatory condition tending to exudation"—exudation being regarded as the "characteristic of this variety of inflammation." The late Dr. Hillier soon afterwards adopted * the doctrine, which was subsequently embraced by Dr. G. Johnson,† M. Mackenzie,‡ and others. Dr. R. H. Semple, the translator of Bretonneau's Memoirs, has long maintained a similar view, and more recently Sir Wm. Jenner § has pronounced himself "inclined to think that the two diseases are really identical." This opinion he repeated and enforced in a debate on the subject at the Royal Medical and Chirurgical Society in 1879. The Report of the Committee, which gave rise to that discussion, recommends that the word "croup be henceforth used wholly as a clinical definition, implying laryngeal

* *Medical Times and Gazette*, April 26, 1862.
† *British Medical Journal*, February 19, 1870.
‡ *Ibid*, March 5, 1870.
§ *Lancet*, January 2 and 16, 1875.

obstruction, occurring with febrile symptoms in children." This definition corresponds with the manner in which the word is constantly employed; but it includes conditions which it is desirable, though often difficult, to discriminate. If any laryngeal obstruction, in a child, attended with fever, ought to be named croup, no wonder we are told that this disease "may be membranous or non-membranous," for signs of obstruction may be set up in children, and in adults too, though less readily, by any form of laryngitis; traumatic cases being specially remarkable. On the other hand, diphtheria may run its course without affecting the air passage; or exudation may, at any period, invade the larynx, and so bring about obstruction.

The German school, following Virchow, restrict the term croup, or croupal inflammation, to cases in which the epithelium is alone involved; in these, where the membranous exudation is detached, the epithelium is rapidly reproduced and no loss of substance remains, consequently no scar. The term diphtheria, or diphtherial inflammation, is then to be understood as implying that the exudation extends deeper into the tissues, where it produces pressure, which is intensified by the swollen state of the tissues, thus interrupting the blood supply, and bringing about sloughing of portions of the mucous membrane. These are thrown off on the surface with the exudation, and the consequent loss of substance leaves a scar. Now the former condition is most common in the air-tube, and seems to be set up in the trachea and larynx of children by causes which in adults produce catarrhal inflammation. The

latter condition occurs in the fauces, but mostly only in connection with a profound general change in the system, and to the two are given the name diphtheria. If the exudation extend to the larynx, it is often croupous, but assuredly the distinction is not so great as has been represented by many of the German school, for in cases of undoubted diphtheria attended by the signs of malignancy and typhoid, and followed by paralysis and albuminuria, the fibrinous (croupous) exudation has been seen to lie on the surface of the membrane, nowhere penetrating its epithelium. This distinction, therefore, must be given up, or it must be admitted that croupous inflammation may set up the constitutional symptoms of diphtheria; while, then, we cannot point to any anatomical differences between croup and diphtheria, the two affections form sufficiently clear clinical groups to warrant us in speaking of each separately.

CROUP.

The word croup, a popular term in Scotland for certain sudden seizures in children, was adopted by Dr. Francis Home in his treatise on the disease,* and has passed into several languages to indicate acute exudative inflammation of the larynx and trachea. The word may have been derived from the Gaelic *Crup*, which means contraction, to show the effect in

* "Inquiry into the Nature, Cause, and Cure of Croup." By Francis Home, M.D. 1765.

the throat, but more likely the peculiar cry would give it the name. The Dutch have the word *Geroff*, corresponding with the German *Ruf*, applied to the sound of the voice, and the Scotch *Roup*, for hoarseness has doubtless the same origin. The disease was not new in Home's time. Indeed, allusions to some such attacks may be found in the Greek writers. It was mentioned as *croops* by Dr. Patrick Blair, in a letter to Dr. Mead in 1713, and that it had existed, and had even been recognised before, is clear, from the remarks of various authors. Thus Baillou,* as early as 1576, described *affectio orthopnoica* as prevalent in Paris, and indicated in the following passage a clear conception of its pathology :—"Chirurgus affirmavit se secuisse cadaver pueri ista difficile respiratione et morbo (ut dixi) incognito sublati : inventa est pituita lenta, contumax, quæ instar membranæ cujusdam arteria aspera erat obtenta, ut non esset liber exitus et introitus spiritui externo : sic, suffocatio repentina." So, too, the disease was recognised by the Spanish school, and Villa Real† not only observed membrane coughed up, but found it *post mortem*, and described it as resembling wet leather. Halen and Wahlborn, in Sweden, both wrote,‡ in the same year as Dr. Home, an account of such attacks, which they considered contagious. Ghisi § had already described the disease

* "Epidemiorum et Ephemeridum." Geneva, 1576.

† Villa Real, J. de, "De Signis, Causis, Essentia, Prognostico, et Curatione Morbi Suffocantis." 1611.

‡ "Forsättning Prov. Doctorernas Berättelser." Stockholm, 1765.

§ "Lettere Mediche." Cremona, 1749.

as it appeared in Italy, and called it *angina strepitosa;* and Dr. Starr * as it appeared in England, naming it *morbus strangulatorius;* and Wilcke† as he saw it in Sweden. After Home we may mention Van Berger,‡ Michaelis, § Johnstone, ‖ and Rush, ¶ who called it *cynanche trachealis,* a name adopted by Cheyne,** and by Cullen in his celebrated "First Lines," 1802.

Still, several affections of the throat were largely confounded with the acute exudative inflammation of the larynx and upper air passages, accompanied by fever, occurring in children, to which it is desirable to restrict the word croup. The modern history of the disease dates from the epidemic of 1805-7, to which a nephew of the first Napoleon fell a victim. The emperor, thereupon, offered a prize for the best essay on the disease. To this incident we are indebted for many good works. The prize was awarded to J. A. Albers, and was published in 1816. †† The report ‡‡ on the essays submitted will amply repay perusal.

* "Philosophical Trans." 1749 and 1750.

† "De Angina Infantum Recentior. Annis Observata." Upsalæ, 1764.

‡ "Morbus Truculentus Infantum," in "Nov. Act. Nat. Curios.," 1764.

§ "De Angina Polyposa." Goettingen, 1778.

‖ "On Malig. Angina, with remarks on Angina Trachealis." Worcester, 1779.

¶ "Med. Inquiries and Observations." London, 1789.

** "On Diseases of Children." Edinburgh, 1881. "Pathology of the Memb. of the Larynx and Bronchia." Edinburgh, 1809.

†† "Comment. de Tracheitide Infantum." Leipsic, 1816.

‡‡ "Rapport de la Commission sur les ouvrages envoyés au Concours sur la Croup." Paris, 1812.

Croup mostly commences as a catarrh, but often so slight as to be overlooked until the more urgent symptoms excite alarm, and call to mind the cold the child had. Very commonly the severity of the attack occurs in the night; and, throughout the disease, nocturnal exacerbations are liable to take place. Cough and dyspnœa of a peculiar noisy character are the main features. The inspiration is very difficult and loud—stridulous it has been called—and compared to the sound a fowl makes when caught hold of. At first the cough is dry, but soon a viscid expectoration is brought up, containing films, or flakes. The exudation is, of course, fluid at first, but its coagulability soon manifests itself. Sometimes it is of creamy consistence, at others it forms solid tough patches or layers, which may extend over the membrane of the larynx, trachea, and bronchi. The little patient is in constant danger of suffocation. The expectoration will vary with the consistence of the exudation and the tenacity with which it adheres to the membrane. Sometimes it is only thick creamy stuff with shreds or flakes, at others larger layers come away, and not seldom complete casts of the tubes are brought up. The voice, as well as cough and breath, is croupy, and this often shows the first departure from health, and gives an early warning of the impending danger. There is sympathetic fever. The false membrane is formed in the larynx and trachea, and sometimes all along the smaller bronchi. It varies greatly in thickness. The thickest part is usually at the

entrance, where, according to Hasse,* it never exceeds three lines, diminishing in density as it descends. Patches are seen now and then in the throat, and may descend into the œsophagus. The affection seems almost always to travel downwards, and consequently the morbid appearances are most constant in the larynx, then in the trachea, and lastly in the bronchi. Dr. Porter,† indeed, seems to have met with cases that took a contrary direction (ascending croup); but both Hasse‡ and Rokitansky§ support the view stated above. Climate and epidemic agencies influence the progress of croup greatly. In healthy country places it is mostly sthenic, and the exudation spreads over a larger surface, and is more dense, while in the asthenic form met with in large cities the opposite appearances are found.

In favourable cases the exudation is cast off, and the mucous membrane beneath soon recovers—the epithelium being rapidly reproduced. In other cases new layers of false membrane succeed each other until the tendency is exhausted, or the patient succumbs to the incidental dangers. These are the consequences of the obstruction to the respiration.

The symptoms, then, are first of all those of catarrhal inflammation in the air-passages, and chiefly in the larynx. Upon these are superimposed those caused by the process of exudation. When that

* "Anatomical Description of Diseases of the Organs of Circulation and Respiration." (Sydenham Society.)

† "Surgical Pathology of Larynx and Trachea." Dublin, 1826.

‡ *Op. cit.*

§ "Pathological Anatomy."

obstructs the glottis we have the most terrible dyspnœa, and when there is yet sufficient space for the air to enter, we may have most violent attacks of glottic spasm, caused by the foreign body—the false membrane. The respiration is not only excessively laborious, it is carried on by engaging every muscle which can help to expand the chest in most violent contraction. The noise, too, is characteristic, and the poor child's distress most piteous. Restless, terrified, haggard, it seeks first to be taken up, then put down, it feels the obstruction in the throat, and will sometimes try to tear it away in an agony for want of breath, which is truly heartrending. If no relief be obtained, a new set of symptoms—those depending on carbonisation of the blood—will soon take the place of these. If the false membrane be removed immediate calm will succeed the storm, and the child may fall into a tranquil sleep. Recovery may begin here, or an exacerbation may awake the patient to a renewed struggle for breath.

Sometimes inflammation, evidently of a croupy nature, produces only a small amount of exudation. The scanty exudation may be due to expectoration of the lymph as rapidly as it is exuded, yet such an explanation seems insufficient, as aphthous ulcers in the mouth are frequently associated with this variety. Another set of cases have been distinguished as pseudo-membranous laryngitis, and the distinction is insisted on by Guersant,* as well as by Bouchut.†

* "Dict. de Médecine."

† "Traite Pratique des Maladies des Enfans Nouveaux-Nés, et des Enfans á la-Mamelle."

The symptoms are more like those of laryngitis, and the expectoration contains at most but a few shreds, and these are never renewed. In true croup according to these observers, the membrane re-forms as soon as it is detached. Dr. John Ware,* of Boston, U.S., separated from membranous croup a form in which no exudation occurs, though the symptoms are the same; this he called inflammatory croup. In twenty-five years he met with 131 cases which he considered croup, but found membrane to exist in only twenty-two, and of these last nineteen died—figures which show that membrane is comparatively rarely found, but when present is excessively fatal. As to the inflammatory cases, we may perhaps suppose that in some only a small quantity of exudation was formed and rapidly expectorated, or more probably swallowed; while others, perhaps the majority, were simple catarrhal laryngitis, in which it is common, as already shown, to find signs of laryngeal obstruction.

The narrowness of the infantile larynx, and the tendency to spasm in children, are most important factors in croup. The small glottis of a child is easily obstructed; out of the body it may be completely closed by a powerful suction at the trachea. Hence the danger of laryngeal diseases in children. Even in catarrhal laryngitis, signs of obstruction may be produced by the congested, puffy, perhaps œdematous condition of the mucous membrane. What, then, can be anticipated, when in such a case extra secretion—perhaps thick, tenacious, and stringy—is

* "Contributions to the History and Diagnosis of Croup."

poured out? Such secretion, if it do not block the larynx, may provoke spasm. If the secretion be thicker still, a solidifying exudation or a false membrane, it may completely line the air tube and so contract its calibre as to give rise to symptoms of obstruction; or it may—a more common event—become detached partially and entirely, and play the part of a foreign body; as such, it may mechanically block the air-passage, or bring about the same result by provoking fatal spasm. These circumstances give rise to serious difficulties in diagnosis, but they illustrate our position that the primary disease is inflammation of the mucous membrane, and that its results are determined by several circumstances. In one case abundant tough exudation is present, and suffices to account for all the symptoms. In another no distinct membrane is expectorated during life, and none is discovered after death; and yet the symptoms have been similar. Now, this is usually ascribed to spasmodic closure of the glottis, which is more easily brought about in the child than in the adult. It is unquestionable that laryngeal spasm may be fatal, but it is not often so in the first attack, and spasm is characterised by distinct intermissions. At the same time we must not forget that there are remissions in true exudative inflammation, as the membrane may be expectorated or removed from the narrow chink of the glottis.

There is, however, another condition the opposite of spasm, which is as likely, according to Schlautmann and Niemeyer, to occur, and which would account for many cases. This is paralysis of the muscles which

open the glottis. Rokitansky has shown that the pale infiltrated relaxed state of the muscles points to paralysis rather than spasm, and, in fact, all muscular tissue is liable to be thus injured by inflammation. In croup the inflammation is severe, and extends through the membrane to the submucous tissue. The muscles beneath have even been found sodden from infiltration. If, then, the crico-arytænoidei postici be paralysed, we have the same result as a spasmodic closure of the glottis—so far that we have inability to open it.

When the glottis is mechanically narrowed, the entrance and exit of air are both impeded, so that both inspiration and expiration are laborious. But in paralysis the air in expiration forces the glottis open without muscular effort, while in inspiration there is obstruction, since as soon as the air inthetrachea is rarified, the vocal cords come together, and the incoming current does not separate them; hence in paralysis inspiration alone is laborious. Thus we have three sources of dyspnœa—the mechanical, spasmodic, and paralytic. This is no mere useless refinement. He who can most accurately determine the conditions presented in a given case will be able best to decide on what to do and what to avoid.

The complications of croup require skilful auscultation and percussion, and it is the duty of the physician to watch for the first indications. Bronchitis is in some stage almost sure to be present, and perhaps fewer escape pneumonia than is generally supposed. One sound, masked as it is to a great extent by

another, will be liable to deceive all but well-educated ears. It scarcely enters into our programme to go into these details, but we may remark that, both in simple and complicated cases, more exact knowledge than many seek for may be gained by attentive listening, provided the rationale of physical diagnosis be kept in view, and ideas of pathognomonic signs cast away.

It is desirable in every case to form a correct opinion on the patient's state, and the difficulties of the physician are often increased by his only being called in at a late stage, and then obtaining but an imperfect history. He must first satisfy himself that the impediment to respiration is situated in the larger air-tubes, and that any accompanying states are complications, although these greatly influence his prognosis and treatment. The next step is to ascertain the presence or absence of false membrane. If exudative inflammation be once proved to exist, this fact ought not to be lost sight of. True croup comes on more gradually than the spurious form; it continues to get worse in spite of manifest *remissions*. False croup comes on very suddenly, soon reaches its height, and is characterised by perfect *intermissions*. The presence or absence of fever will not be overlooked in regard to diagnosis.

Treatment of croup.—Two points demand constant remembrance. First, the sudden onset and rapid progress point out that no time is to be frittered away. Second, the naturally remittent nature of the disease must not lead the attendant into the error of relaxing his vigilance, and encouraging the ill-founded

joy of anxious parents, soon to be plunged into bitter disappointment; nor into the equally dangerous fallacy of repeating remedies which appeared to arrest a former paroxysm. Perhaps it is forgetfulness of such points which has made all specific directions for the treatment of this disease bad in themselves, mere treatment by rule only hastening the catastrophe. For this reason, too much detail will be avoided here.

In his first edition the author spoke in rather strong terms of the teachings of certain text-books respecting blood-letting. During the period which has since elapsed, he has seen a gradual but constant approach to the views he expressed so many years ago, and for which he was, at the time, subjected to some adverse criticism. There are but few now who practise venesection in children. Even leeches are less frequently used than formerly, although many still recommend them in cases where there is much inflammation and fever runs high in robust children. Although local depletion may moderate hyperæmia in the neighbourhood, it is now generally admitted that it cannot arrest the process of inflammation, still less can it prevent the formation of exudation. It may, however, debilitate the child, and in puny patients it is not justifiable. No doubt the excessive congestion which sometimes occurs in this disease may bring about infiltration of the tissues and aggravate the danger, and it is perhaps by temporarily restraining this congestion that leeches have seemed to so many practitioners to render important service. This, then, remains the only plea for their use in robust patients. If used they should not be put over the larynx

because there it will not be possible to arrest the bleeding by pressure. The usual spot is over the manubrium sterni.

There is, however, one antiphlogistic which is highly prized by the German school. Both Niemeyer* and Steiner† are convinced of its valve, and it has long been in use with certain practitioners. This is the local application of cold; cold compresses to the neck afford the readiest mode of bringing this agent to bear, and the medical man will do well to apply the first himself, in order to instruct the nurse how to do it properly. Where a bladder and ice are at hand, dry cold can be used. It should be observed that the use of cold to the neck does not interfere with warmth to the general surface, still less with vapour to the mucous membrane. Cold cannot move plugs of exudation, nor is it to be continued when asphyxia impends: it has no power to prevent poisoning by carbonic acid retained in the blood.

Emetics fill a most important place in the treatment of croup, but not as antiphlogistics or revulsives, still less as specifics. They often enable a child to bring up false membrane which he could not expel by his own efforts. For this mechanical purpose they are indicated when false membrane is acting as an obstacle to the breathing and cannot be coughed up: the impediment to expiration is of great value as a sign of this. It will be seen, therefore, that full emetic doses must be given, and when the drug selected does

* "Text Book of Practical Medicine," vol. i.

† Von Ziemssen's "Cyclopædia," vol iv.

not operate another must be used, or other means resorted to in order to excite vomiting. A good deal of false membrane is often brought away by this act, which may be excited every two, three, four, or six hours.

The emetic most frequently resorted to is perhaps antimony, which also enjoys a reputation as an anti-phlogistic. But we have seen that this is not the object of giving emetics; nor is their recognised diaphoretic action. Moreover, the depressant effect of tartar emetic ought not to be forgotten, nor its tendency to produce diarrhœa. In delicate children, for this reason, ipecacuanha is often preferred, but it is less certain and rapid in action. It is, perhaps, a perception of these differences which has led many to combine the two with good effect.

If antimony be decided not suitable, or, as will now and then happen, if it will not excite vomiting, other emetics may be tried. Where there is want of tone, sulphate of zinc is very valuable, and may be combined with ipecacuanha, or given alone. Sometimes it may be advisable, when emetics fail to act, to add to them stimulants which often cause them to operate. Occasionally mustard or ammonia in strong decoction of senega may be tried. Sulphate of copper has been highly extolled, and its small bulk renders it easy of exhibition, but it is a powerful poison. Alum was very much relied on by Dr. Meigs.* An emetic always at hand, and generally effectual, which I recommended twenty-five years ago, is common salt. It

* "Diseases of Children."

has an undoubted effect on the exudation, so that it will be likely to detach any membrane located in its passage to the stomach. It may, too, be absorbed and exercise some effect through the blood. At all events it will never do harm. A little mustard added to it combines a saline and stimulant emetic of great use, in obtaining which there will be no delay. Vomiting may sometimes be provoked by topical applications—just as when we tickle the fauces for that express purpose. Time is so often against us in these cases, that those having the material at hand will not need to be reminded of the emetic power of hypodermic injections of apomorphia. The prompt action of this remedy, the slight degree of depression it causes, and its recently-proved power to increase secretion entitle it to the first place in our confidence.

From what has preceded, it will be seen that there is nothing in favour of giving nauseating doses of antimony or other emetics between the acts of vomiting. The practice, still sometimes pursued, perhaps from the idea of its antiphlogistic power, is fraught with danger. Such doses not only debilitate, but frequently frustrate the intention of the larger ones, by rendering the stomach more tolerant of them.

Mercury was long believed to have the power of arresting croup, and now many who scarcely credit it with this think well to administer it. On the use of this drug, the German School is as divided as the English, for while Oppolzer condemns it as only likely to produce diarrhœa, debility, and ptyalism, Niemeyer sanctions it. Those who follow the old plan

will do well to suspend it during the exacerbations, and give the emetic which is most indicated; or they can use mercurial inunction. The oleate may be preferred to the ointment. Ten minims may be gently rubbed in every hour or two. Still greater promptitude is sought in the hypodermic method which is well adapted to cope with the rapid march of this disease. Dr. Jacobi in his treatise on diphtheria, 1880, confessed that he was less sceptical about mercury than a quarter of a century previously, and in 1884 he recommended, at the New York Academy of Medicine, small but frequent doses of corrosive sublimate, of which he said infants of tender age could bear half a grain a day for several successive days. Cyanide was recommended by A. Erichsen* in doses of one-hundredth of a grain up to three years of age, and one-fiftieth of a grain in older children. This salt was again brought forward at the International Congress in London (1881).

In France mercury is not at all believed in. A. Descroizilles† says in spite of what is said in England and America it only salivates, debilitates, impoverishes the blood and facilitates hæmorrhages. In E. Bouchut's‡ recent work mercury is not even mentioned. When mercury is administered inunction or the hypodermic method offers obvious advantages, and for the latter the albuminate or peptonate seems the best preparation.

* *St Petersburgh Med. Woch.*, 1877.

† "Manual de Path. et de Clinique Infantiles," 1884.

‡ "Clinique de l'hôpital des Enfants Malades," 1884.

[illegible] and [illegible]

[illegible] It consists mer[illegible]
hot water by means of a [illegible]
and held close to the skin [illegible]
[illegible] As it cools, it is [illegible]
[illegible] In ten or twenty
[illegible] perspiration occurs, an
[illegible] con[illegible]
[illegible]

is made for the admission of
does not extend too low down
happens. Even then, however
succeed; besides, able observe
tracheotomy tends to arrest
cannot be said to cure croup, but
for air, and thus prevents the
asphyxiated by closure of the
not cure croup, but, by removing
act of vomiting often saves life
cannot be accomplished, and
closed, what can be more rational
vital fluid through an artificial
seat of obstruction? The
often looked upon as the last
postponed until Death had
victim. If an opening is to be
early enough; at the same time
cases thus cured might have
ordinary measures. In private
will combine to delay it long
The operation when it fails to
easy and painless. Parents who
dure will not hesitate to give
it affords when they learn that
done; and that, even if it be
darling will be saved the horrors
most painful for anyone to witness
fully and painlessly instead the final
in a scene they dreaded contemplation
Although suggested by Home in
was first performed by John A

Counter-irritation has provoked much difference of opinion. The practitioner will bear in mind that children are tender, and will not wish to distress them when he can help it.

Here, perhaps, is the place to mention the remedy which above all others, no one can find a fault with, provided it cure; it was proposed by Dr. Lehman, of Torgau, and its efficacy was relied upon by Graves. It consists merely in the application of hot water by means of a sponge, squeezed half dry, and held close to the skin covering the larynx and trachea. As it cools, it is to be changed for another in readiness. In ten or twenty minutes great redness exists, perspiration occurs, and relief of cough and breathing. Dr. Graves* considered he saved several patients by this method, but that it is only applicable to cases seen at the onset; obviously it could have no effect on membrane already formed.

Tracheotomy is still a moot point. It is not to be denied that an artificial opening into the air-passages will prolong life in cases of obstruction to the free entrance of air above such opening, nor that in many cases of croup such obstruction is the immediate cause of death. So far as this point is concerned, it does not even matter that the aperture is not constantly closed by lymph, for it may easily be sufficiently obstructed to cause asphyxia; besides which it may be said that, in consequence of the irritation produced by the foreign substance, spasm frequently completes this closure. By tracheotomy, provision

* "Clinical Medicine," vol. ii.

is made for the admission of air *when the exudation does not extend too low down;* but this too frequently happens. Even then, however, the operation may succeed; besides, able observers are of opinion that tracheotomy tends to arrest the morbid process. It cannot be said to cure croup, but it provides a passage for air, and thus prevents the patient from being asphyxiated by closure of the glottis. So emetics do not cure croup, but, by removing false membrane, the act of vomiting often saves life. When this removal cannot be accomplished, and the glottis is becoming closed, what can be more rational than to admit the vital fluid through an artificial opening below the seat of obstruction? The operation has been too often looked upon as the last resource, and therefore postponed until Death had too evident a hold on his victim. If an opening is to be made at all, let it be early enough; at the same time, many will think that cases thus cured might have been tractable under ordinary measures. In private practice, several causes will combine to delay it longer than is advisable. The operation when it fails to save life, renders death easy and painless. Parents who dread such a procedure will not hesitate to give their child the chance it affords when they learn that nothing else can be done; and that, even if it be without avail, their darling will be saved the horrors of a death-struggle most painful for anyone to witness, and, sink peacefully and painlessly into the final slumber, instead of in a scene they dread to contemplate.

Although suggested by Home in 1765, this operation was first performed by John Andrê, in London

in 1782—at least, this is the earliest case that remains on record. In 1810, M. Bretonneau performed it, but his patient died. In 1824, he tried it again, with the same result. In 1825, notwithstanding his previous failures, he once more resorted to it, and this time success crowned his efforts. Since then, numerous patients have been subjected to the operation, of whom about a fourth have recovered. For a time, Trousseau seems to have saved half his patients. Steiner's mortality has varied, in different periods, between 60 and 70 per cent. Others mention about the same; but Greve, of Sweden, speaks of only 23 per cent.

But are there no less terrible means at our command than the inflictions hitherto discussed? Without for a moment wishing to lessen the promptitude with which the disease is met, we venture to say, Yes. We may endeavour to dissolve, or at least render less coagulable, the false membrane; or, failing this, we may remove it mechanically.

The application of the vapour of hot water is most soothing to the lining of the larynx. It is obvious that inhalations in the usual way would be a matter of considerable difficulty for children. Moreover, in such a disease as croup, the respiration is so impeded as of itself to constitute an objection, both to the sponge and the inhaler. It is easy, however, for the little patient to be kept in a warm, moist, uniform atmosphere. For this purpose, as urged by me a quarter of a century ago, the temperature must be kept much higher than is usual in any sick-room. Moisture, too, when employed, must be in proportion.

The patient is to be kept, as it were, in a vapour-bath, though in the early stage it may be found that hot air alone is more effectual; or, in some cases, impregnated with steam, in others not. It is not to be supposed that vapour thus used will remove the exudation, which we know is insoluble in water; but the presence of moisture and warmth during formation may modify its consistence or its tenacity, and, experience encourages us to follow up what is so soothing. Moreover, we may make the vapour a vehicle for chemical agents intended to act upon the exudation. This is simple enough with volatile substances, but in the case of fluids we may avail ourselves of the atomiser to distribute the remedy, in the form of a fine spray, through the apartment, or through the space enclosed by the croup-tent where the little patient lies. With very young children, such a space may be formed by blankets suspended round a large bed, the steam and spray being supplied regularly. In this case it is necessary to look after the ventilation, which is apt to be forgotten. The patient needs a continual, free supply of fresh air however warm and saturated with vapour and spray it may be. Care should be taken to convey it continually into the room, and thence behind the blankets. It seems reasonable to expect relief; and the sponge to the throat, topical applications to the membrane, and, indeed, all the other remedies which have been recommended, may be used at the same time. There is nothing new in the principle of this treatment. For a long time it has been customary to keep the room warm, and even to add some moisture by means

of a kettle kept on the fire, with a long tube attached to its spout to conduct the steam into the apartment. But such a course is insufficient. What I recommend is, that the heat and moisture be increased to a much greater extent than occurs in this way. To produce an effect on the skin, the temperature must be greatly increased; to get the effect of the vapour on the exudation, the air is to be saturated. The slaking of successive portions of lime has been resorted to as a ready means of carrying out this treatment, and some of the lime-water thus formed is thought to pass into the air and act on the false membrane.

When this plan fails, we may still attempt the mechanical one. Tubage of the larynx will secure a passage for air, but when false membrane endangers life why should we hesitate to wipe it off, and apply local remedies to the inflamed mucous surface beneath? It is quite practicable to do this in the case of the larynx. In pre-laryngoscopic days this procedure was recommended* by the late Dr. Horace Green. Some of his contemporaries would not admit that his applications entered the larynx; but now that we have been for years accustomed to see and demonstrate to others the steps in difficult operations within the larynx, it is no longer necessary to reply to those who doubt the possibility of doing what all skilled in laryngoscopal therapeutics find an easy feat. Local remedies intended either to act on the false membrane or mucous surface will be considered further on when

* "Observations on the Pathology of Croup: with Remarks on its Treatment by Topical Applications." New York, 1849.

speaking of diphtheria. In using them, the mechanical effect of wiping off the exudation should not be forgotten; and though firmness of touch is needed, the utmost gentleness is essential in dealing with the sensitive, inflamed larynx of an infant.

False Croup.—A few words must be added on false croup, crowing inspiration, or laryngismus stridulus, as it has been called, since serious errors in diagnosis, tending to improper practice, have been made. A little care will distinguish the two affections. False croup is essentially a spasmodic ailment, whatever may be the exciting cause of the spasms; consequently it is not accompanied by sympathetic fever, and when the paroxysm has passed the respiration is free. It is not half so important to distinguish the varieties of croup as to separate them all from purely nervous disease. Croupal symptoms in laryngitis, in tracheitis, in laryngo-tracheitis, and the pseudo-membranous laryngitis of M. Guersant, may be looked upon as one disease. It is well, indeed, to know, not only the existence, but the extent of exudation; but it is far more important not to confound an inflammatory with a nervous affection. In the latter, the temporary obstruction to the inspiration may be greater than in true croup; the cry, when the air enters, louder; but it does not exactly counterfeit the stridulous inspiration of the narrowed tube. This cry, however, of itself is not sufficient to discriminate a case; for in true croup the passage may be only slightly diminished. There are often convulsive symptoms in the false variety—so often, that many have looked upon them as a necessary part of the disease.

It is intermittent; the paroxysms are very short, and frequently occur at night.

For a long period it was known to attentive observers that the seizures called false croup might be produced in various ways. It was conjectured, too, that many of the cases grouped under that name might be due to spasm of the muscles which open the glottis, or to paralysis of those which close it. The laryngoscope enables us to say that either of these conditions may exist in adults as well as children. In ricketty and scrofulous children, and in those of a highly nervous disposition, spasm of the glottis is easily excited by various causes. Thus, in some such subjects, laryngeal catarrh seems to be the starting point of this disease, every little cold they take exposing them to a fresh series of paroxysms. These are the cases most likely to be confounded with true croup, but there is only temporary—or, so to say, momentary—obstruction to the respiration. One remove further from croup—in appearance—we get a number of cases difficult to generalise, excepting so far as that they are instances of ailments in children in which spasm of some part of the respiratory apparatus is the prominent symptom. One case will resemble the catarrhal affection, another borders on whooping-cough, a third, to some extent, asthma. Yet in all these the disease is spasmodic, and may be produced by any irritant to the laryngeal nerves. Thus we may meet such attacks in the course of consumption, of bronchocele, of enlarged glands, or any tumour in the neighbourhood. A form caused by enlarged thymus, and called thymic asthma—very

rare—has attracted attention. Some would add the various causes of convulsive attacks. [See the chapter on Laryngeal Neuroses further on.]

DIPHTHERIA.

This disease, named by Bretonneau *diphthérite*, from διφθέρα, (membrane or skin), attacks adults as well as children, but does not necessarily affect the air passages. In diphtheria the exudation occupies the fauces, and is consequently within the range of vision, but it may extend down the air-passages, constituting croupal diphtheria, or diphtherial* croup. It is accompanied by intense depression. The fever is of the lowest type. Death occurs more frequently by asthenia, the patient not often being asphyxiated, as is so common in croup. Some of the most distressing circumstances of that disease are therefore absent, except in the mixed forms. A very mild form of exudative angina has already been noticed. It is most frequently seen during epidemics of the more formidable species. Perhaps its mildness is due to the vital power being able in some constitutions to resist the effect of the morbific element. But this must not throw us off our guard, for diphtheria often begins with slight symptoms. A little dulness, a hebetude, some loss of appetite perhaps, a chill, or an uneasiness in swallowing, may be the only warning.

* The termination *itis* has been generally rejected in England, though many writers use it in the adjective form. It seems better to adopt the simpler ending.

In other cases nausea, or even vomiting, with sore throat, may precede the appearance of exudation. But so insidious is the disease that it is only rarely seen by the medical man before some few flakes have appeared in the fauces. At this period a child will perhaps continue to play, or an adult to work with little diminution of energy. Nevertheless, there is danger, for although very mild cases recover rapidly and leave no ill-effect behind, they may at any moment become severe or put on the most malignant form.

When, therefore, a person is known to have been exposed to the contagion, or when the disease is epidemic, we may feel suspicious of every slight sore throat, especially in weakly people—or when there is adynamic rather than sthenic fever. Let then the glands of the neck be examined, for they are often enlarged very early without much pain. Sometimes stiffness, or pain in the neck, may be the first complaint made by the patient. Luschka has pointed out that the glands lying about the bifurcation of the carotid are in immediate relation with the lymphatics of the soft palate. It should not, however, be forgotten that the cervical glands are liable to enlarge in ordinary inflamed sore throat, and, therefore, the diagnosis is not certain until exudation appears. After that no doubt remains, and cases in which only a small quantity of membrane forms may run a rapid and fatal course. Even when there is no loss of substance perceptible—no slough so to say—and the exudation does not become offensive, it is by no means sure to prove a mild case, and the sequelæ

may be as formidable as in cases beginning with more urgent symptoms. In these, at an early period there is foul breath from putrescence of the exudation—the glands are very large and hard, but do not suppurate. Death may occur early from syncope or general collapse. When exudation takes place in the larynx the symptoms and course will be modified—the case is, as it were, a combination of the two diseases, croupal diphtheria. When it invades the nasal passages other symptoms arise, and these cases, very distressing and very fatal from septicæmia, are sometimes grouped together as nasal diphtheria. A thin irritating discharge from the nostrils is a serious symptom in all cases of diphtheria, for which it is well to be on the look out as the precursor of further trouble.

Many attempts have been made to distinguish the exudation of diphtheria by the microscope. The discovery that thrush depended on a parasite naturally stimulated the search in this direction for the cause of diphtheria, and the late Professor Laycock, as early as 1858, having met the *oïdium albicans* in a case which he considered diphtherial, was inclined to regard that fungus as the efficient cause of the disease. But in his case the appearance of exudation supervened on a lengthened illness, and may probably be regarded as an aggravated case of thrush occurring during an epidemic of diphtheria. At any rate, it cannot be called a typical case of the disease; and more recent observations seem to show that diphtheria is antagonistic to the presence of the *oïdium albicans*. In 1868, Oertel, Huebner, and Buhl almost simultaneously announced that they had found certain form

bacteria in the exudation of diphtheria, as well as in the subjacent tissues, and even in the blood of their patients. Since then they have strenuously maintained that diphtheria is essentially a parasitic disease, and they are supported by Klebs, Eberth, and many others. According to them, without parasites there can be no diphtheria. The organisms they describe are exceedingly minute, and mostly belong to the bacteria of Cohn. One in particular, sphæro-bacterium—the micrococcus of Oertel—is always present. It is accompanied in lesser numbers by the bacterium termo, a rod-like organism. Other forms are also sometimes seen. It is obvious that if these bacteria be the sole cause of diphtheria, we may distinguish this disease by the microscope, as Oertel and others declare they can, and the influence of the theory on practice is also important. With regard to the benign organisms—oïdium, spirilla, leptothrix, &c., so constantly present in the mouth, Oertel says he has seen them disappear on the advent of the deadly diphtherial vegetation, and only return after the departure of the micrococcus. The last, therefore, appeared inimical to the others. Moreover, the bacteria are said not only to abound in the exudation, but to penetrate the tissues beneath, and find their way into the blood.

There are, however, many differences among the advocates of parasitism. Klebs described in 1873 a microsporon diphthericum, but ten years later, at the Wiesbaden Congress (1883) he admitted two forms of diphtheria, one local, without any tendency to descend from the fauces into the larynx; the other bacillary, which rapidly invaded the air passages, and formed

multiple foci in the lobular bronchi and in the acini—a septic disease.

Loeffler* reports that he has found and cultivated separately both micrococci and bacilli, but the former only in deep gangrenous diphtheria. May not that mean that they were only present in the late stage? Inoculation with cultivations of micrococci did not propagate the disease, which, however, was produced by the bacilli. It seems from his experiments that the surface must be broken or inflamed, as the cultures did not injure healthy membrane. He thinks the poison is developed by the specific organism at the local seat, and that the constitutional effects follow—a doctrine to which most recent investigators incline.

Professor O. Heubner, in his "Experimental Diphtheria," which gained the German Empress's prize, says the organisms he found in the exudations were not met with in the vessels of the mucous membrane. He produced the appearances of the disease by cutting off the blood supply of the part, but the exudation thus produced did not set up the diphtherial process when inoculated. He thinks the poison is stored up in the diseased membrane. Necrotic changes, septicæmia, and malignant œdema might follow inoculation of rabbits with the oral secretion of healthy persons.

Emmerich† describes an organism which is neither a coccus nor a bacillus, but a bacterium, which he found in gelatine cultures—thick, short, of a greyish colour, becoming whiter as it developes, but not liquefying

* "Mittheilungen aus dem Kaiserlichen Gesundheitsamte." Herausgegeben von Dr. Struck. II., 1844.

† *Deutsche Medizin. Woch.*, 1884.

the gelatine. Inoculations with these cultures propagated the disease. He detected them by cultivation in the liver, spleen, kidneys, and blood.

M. Darier* found micrococci in the early exudation resembling those of pneumonia, and a few others distinguished by an oval form. He also found bacilli, but they were less numerous and disappeared after about seven days. He says the true diphtherial organism has not been detected in the blood—being thus at variance with Hueter, Tommasi-Crudelli, Oertel, and others. Cornil (Bactéries) has found them in the interior of blood-vessels in microscopic sections.

Drs. H. C. Wood and H. F. Forward, in an appendix to the Report of the National (U.S.) Board of Health, 1884, have definitely adopted the parasitic view, but the masses of micrococci, they observed, do not seem distinguishable from organisms found under other circumstances in the throat and mouth.

It has been suggested that some of the differences may be reconciled by the existence of intermediate forms. Obviously, further research is needed, and it is not surprising, amidst so many difficulties, that, although a considerable number of observers have embraced the parasitic theory of diphtheria, it is by no means universally accepted. The question is of practical importance in reference to the infectiveness of the disease, respecting which very diverse views have been maintained. All epidemics present difficulties in investigating this property. That every exudative

* "Thèse de Paris," 1885.

inflammation is contagious cannot be admitted; but that this special form may thus be propagated is not, we know, improbable. Bretonneau strongly maintained that it had this property. Yet he declared its contagiousness far less energetic than that of other diseases. It has often failed to spread by direct implantation of the exudation; but, on the other hand, it has more than once appeared to do so by an accidental inoculation—several medical men having fallen victims to such an occurrence when performing tracheotomy.

Trousseau and Peter actually inoculated themselves with diphtherial exudation, and no effect followed. Still, this experiment does not prove that the disease cannot be so communicated. Some other persons, having too much respect for themselves, inoculated dogs and other animals without results; but Trendelenburg and Nassiloff afterwards proved the possibility of infecting animals by inoculating the trachea and the cornea. Nassiloff, together with Oertel and Hueter, described the appearance of the bacteria after such inoculation, and maintained that their presence was necessary. If this be admitted, we may rationally conjecture, that when the inoculations failed those organisms were not present in the exudation employed, or else they did not find a suitable nidus. In the former case it would be said that the cases yielding the morbid product were croup, not diphtheria; and quite recently Dr. Renshaw has reported* such a conclusion from experiments on animals.

* *Practitioner*, January, 1885.

The exudation, though more adherent, is generally less solid than that of croup. Indeed, all exudations appear to be firmer in proportion as the inflammation is of a sthenic kind; the least dense are those of the lowest epidemics of diphtheria. In these, large quantities of serous fluid, and even of blood, are often poured out. The exudation thereby disintegrated mixes with fluid and detached sloughs, the whole in a state of decomposition forming abundant discharges of a most intolerable odour. The glands of the neck early enlarge, and abscess often takes place in their neighbourhood. These traits suggest that diphtheria must be to a great extent a blood disease. No mere local lesion gives rise to such a formidable train of symptoms, and the consequences which often follow point in the same direction.

Various complications are likely to arise in the progress of diphtheria. Hæmorrhage from the nose, throat, and air-passages is not uncommon. Pulmonary complications must be watched for throughout. Albuminuria, first noticed by Dr. Willoughby Wade*, is present at an early stage in about a third of the cases, and may also come on later. It is, however, a transient phenomenon and does not seem to increase the danger. The glandular swelling may call for unremitting attention.

The most remarkable sequel of diphtheria is the paralysis. This comes on often after convalescence has seemed established. It usually begins in the

* *Midland Quarterly Journal of the Medical Sciences*, April, 1858.

throat, and displays a remarkable tendency to occupy successive groups of muscles, ultimately perhaps involving the whole body. As soon as the voice becomes nasal, or deglutition impaired, attention must be given to the danger. Soon food will return through the nose, or remain in the throat, or find its way into the air-passages and set up inflammation. The paralysis involves both motor and sensory nerves, and may become complete, when the ingenuity of the attendant will be exercised to provide for nutrition and avoid the incidental dangers. If these be safely surmounted recovery usually takes place, the several muscles being restored in the order in which they become affected, but death may occur.

Everyone who has seen much diphtheria is aware that many anomalous symptoms referable to the nervous system are sometimes encountered many weeks after convalescence is established. Imperfect co-ordination or a degree of paresis may be named as frequent. Bernhardt has observed that the knee-jerk is absent in a considerable proportion of convalescents. In thirteen out of twenty-one cases it was absent in both knees, and in one other case in one knee. This sign was not necessarily accompanied by paralysis of the soft palate, or, indeed, any symptom of definite disease. The re-establishment of the normal reflex comes on very gradually, taking five or six months. Paralysis of accommodation is a sequel to diphtheria which may be mentioned in this connection as worthy of study,* and a paralysis of all the muscles of the eye

* Vide Tweedy in *Lancet*, June 14th, 1884.

has been recorded by Uhthoff.* There is some uncertainty as to the electrical excitability in diphtherial paralysis, some observers reporting it as unimpaired, while others only obtained the re-action of degeneration. Evidently further investigation of these phenomena may be fruitful.

Treatment.—Both constitutional and local measures are called for. All depressing remedies are to be avoided, the main consideration being to support the patient's strength. This is to be attempted by nutrients in every form that ingenuity can devise. Detailed instructions for conducting the case will not be expected here, but it may be added that the medicines most generally in favour are directed towards sustaining the patient. Perchloride of iron in large doses stands perhaps at the head of these, and is also used topically. Quinine is sometimes preferred, or given at the same time. Chlorate of potassium, though often given on the faith of an erroneous hypothesis, is believed by many to exercise a good influence; Dr. Willoughby Wade combined it with iodide of potassium, and reported great success, with no subsequent paralysis. Guttmann held pilocarpine to offer us almost a specific, and Fielden reports that he had only 17 deaths in 195 severe cases treated with this remedy. Beck† also speaks of its good effects. Jacobi's‡ estimate seems to me more just, that while it loosened the false membrane by the copious secretion it produced, its depressant

* *Neurologisches Centrabl.*, 1885.
† *Archives of Pædiatrics*, 1885.
‡ *Medical Record*, 1885.

effect on the heart required its early withdrawal, or in septic cases it might accelerate death. Alcohol has been largely employed, and some have kept their patients on the verge of intoxication, but others have used scarcely any. Dr. F. Vogelsang uses peroxide of hydrogen, both internally and locally.

Much good may be accomplished by local measures. Escharotics, so largely tried at first, are discarded by most authorities as more frequently mischievous than otherwise. The attempt to dissolve the false membrane seems more natural, and *solvents* are therefore sought. Lactic acid, lime-water, pepsin, and papain have been used for this purpose. My best results have been with lactic acid. It would seem as if lime must soon be converted into the carbonate by the respiration. Instead of attempting to destroy or dissolve the exudation, Dr. Morell Mackenzie proposed to exclude the air by varnishing the surface on which it appears with tolu dissolved in ether, 1 in 5. At the International Congress he brought forward important evidence of the value of this plan which yielded him more favourable results than any other local measure. But perhaps the agents which just now are looked upon with the most confidence and hope are

Antiseptics and Disinfectants.—All of these seem to have done good service. They can be applied by insufflations of powders, by painting with liquids or by inhalations and sprays. They can also be used at the same time, as the more simple agent steam, as already explained when speaking of croup.

The value of watery vapour in all exudations

was insisted on in the first edition of this book issued in 1860. It has lately been advised as the outcome of German medicine. Now that this homely remedy has been invested with the glamour of German theories it may obtain more attention than when it was thus urged from the clinical standpoint of the English school of medicine. I confess that I was not led to its use by reflecting on its "pyogenic properties," nor am I sure now that all its value is to be summed up in the power of warmth to quicken the formation of pus, and so lead to the false membrane being thrown off. I was content to show that it soothed, that it assisted the removal of the exudation—which seemed to be got rid of and even broke down under its influence—that it never did the harm which caustics and other irritants sometimes seemed to do, and that it could be used in conjunction with other remedies. I may, therefore, well feel satisfied that my clinical deductions are borne out by the profoundest theorists, and that even the leader of the parasitic doctrine has embraced my practice as the best of all. I ought perhaps to feel the more satisfied since this is only one out of several instances in which my teaching has passed over to Germany, and having there received what we must perhaps call the official stamp of this generation, has been afterwards adopted at home. The disadvantage of this custom to our own English school—which certainly bears the palm for clinical, if not for hypothetical, work—is that during the time thus lost in procuring a foreign stamp, some patients may be deprived of the benefit of really native ideas.

It is when the air passage is implicated that the propriety of tracheotomy must be mooted, but much as the success of this operation seems to depend on the opening being below the seat of exudation, it has undoubtedly saved life where this was not the case. No one would open the air-tube unless the impediment to inspiration seemed likely to be fatal. The operation can have no power to prevent death by asthenia. But there are many cases in which tracheotomy offers an additional chance of life. It is more frequently resorted to on the Continent than in England. The statistics of the Ste. Eugénie Hospital, Paris, show that 2,312 operations of tracheotomy were performed during twenty-two years, with 509 recoveries. In the hospital for sick children in Paris, 2,351 patients were operated on in twenty-five years with 614 recoveries. In all the hospitals of France, taken collectively, the average recoveries are about thirty per cent. Dr. Krönlein furnished a report* of all the cases of diphtheria admitted to von Langenbeck's Hospital from January 1 1870, to July 31, 1876. There were 567 cases, of which only eight were adults. The mortality gradually sank from 76·7 per cent. in 1870 to 60·3 in 1876. Tracheotomy was performed in 504 of the cases, of which 357 died, the mortality falling in the latter part of the time, but whether this depends on improved after-treatment, or abatement in the virulence of the epidemic, is doubtful. In 1876 the mortality was 60·3 per cent. There were eleven recoveries in children of the first and second years, the youngest being only seven months

* Langenbeck's "Archiv.," Bd. xxi., heft. 2, 1878.

old, so that it would appear that the opertion may save life in these unfavourable cases. Dr. Henoch reported to the Berlin Medical Society in 1884, that 319 cases of diphtheria were admitted to the Berlin Charity Hospital in 1882-3. Of these 216 were between the ages of two and five years. The mortality was 208. Of those under three only 17 out of 118 recovered. Tracheotomy was performed in 138 cases, with only 16 recoveries — 11½ per cent., but 17 deaths were due to the supervention of scarlet fever. Only two out of sixty-six tracheotomies under three years of age survived. Dr. Gay, at the American Surgical Society, reported 400 cases admitted to the Boston Hospital in eight years. No case of pseudo-membranous laryngitis recovered without operation. Tracheotomy was performed 118 times with 39 recoveries = 1 in 3. Dr. Gay operated himself 62 times with success in 20. He regards suction as useless, and advises inflation with a catheter, as recommended by Bigelow in 1867.

It should be observed that tracheotomy fulfils only one indication, and that besides the necessary after-treatment which is of vital importance, other measures are to be employed with the same diligence as before the operation. It is also possible to apply local remedies through the tube. When the operation is refused we can only persevere in such means as are available, the most desperate cases having occasionally been saved.

In nasal diphtheria, local measures should be had recourse to from the first appearance of any discharge from the nostrils—weak disinfectant, and sometimes astringent liquids being frequently employed.

CHAPTER XI.

EXANTHEMATOUS SORE THROAT.

THE whole of the mucous membrane is liable to be affected in the eruptive fevers. The gastric as well as pulmonary portion is often seriously implicated. Chronic diarrhœa, from ulceration in the bowels, and phthisis and chronic bronchitis, are among the sequelæ of this class of diseases. In measles and scarlet fever is most manifest the complete upset to the system; the patient droops and declines after either in much the same way. The physiognomy is somewhat diagnostic between the two. The most important eruptive fever is scarlatina, but the others deserve mention. For the most part, the eruption seems to extend from the skin. The affection of the mucous membrane usually commences with an erythematous congestion, and then proceeds to put on the distinctive form.

In *Small-pox* the eruption very often spreads to the mucous membrane of the mouth and throat, and presents precisely the same appearance as on the skin, but besides the pustules, when distinct there is the

inflammation of the intermediate surface. The pituitary membrane may also suffer in the same way, though perhaps both nose and fauces are more often highly inflamed with a very few or no pustules. There is so much discharge in such cases that the nostrils are often quite blocked. The probability that this statement is the correct one is increased by what we see in the eye. The conjunctiva is almost always inflamed, and there is copious secretion and great sensibility to light. Sometimes a pustule forms on the ocular conjunctiva, and leads to ulceration and destruction of the cornea. The larynx and trachea suffer in this way to a considerable extent. The throat symptoms come on about the sixth day. Inspection then shows the inflammation of the mouth, nose, and fauces. There will be excessive flow of saliva, coryza, difficulty in swallowing, hoarseness, dyspnœa, and other symptoms corresponding with the part most affected, and these symptoms will increase in severity. Türck* watched the development of pustules in the larynx in the early days of laryngoscopy. It was previously known from *post-mortem* research that they formed in the larynx and trachea. There is, however, no doubt that the laryngeal and tracheal symptoms depend on the acute deep inflammation. Indeed, œdema of the larynx may occur as the most formidable of complications, and the results of the deep inflammation of the air passages may remain even when recovery occurs. Further, pustules have occurred in the rectum, and it has been con-

* *Klinik*, p. 180.

jectured may be present along the whole alimentary tract. There is no reason why any individual part should not be attacked, though we can scarcely picture a patient surviving such an extent of the disease. Even the genito-urinary mucous membrane often suffers in this dire disease. I have not met with any proof that in this case it is pustular. Varioloid eruptions, as well as true small-pox, may be complicated with sore throat.

In *Measles* we observe inflammation of the respiratory mucous membrane from the very commencement, and often throughout its extent. The alimentary lining is also very generally in an irritable state, and this often passes into severe disease. The peculiar character of the ailment is not more distinctly marked in mild cases, being only a state of inflamed sore throat; but in severer cases it puts on a more definite appearance: the fauces become dusky and livid, and that in distinct patches, which on careful investigation are observed to present appearances similar to the cutaneous rash. Sometimes exudation may take place, leading to pseudo-croup, or even without this there may be occasional attacks of spasm of the glottis. From this liability of mucous membrane to suffer, we see in every bad epidemic what are called the complications of measles, tonsillitis, pharyngitis, laryngitis, tracheitis, bronchitis, parotitis; indeed, inflammation in any part terminating in all its forms from resolution to gangrene. But the feature of the disease is rather the extent of a superficial inflammation of the respiratory tract—a true catarrh of the air passage. The pituitary membrane suffers from

the first, so often does the conjunctiva. Hence with what is called a severe cold in the head—a true rhinitis—the child has watering of the eyes, a blood-shot condition of the lids and globe, and increased sensitiveness to light. Backwards the catarrh takes its way, and spreads over the whole faucial surface, but it has not skipped over the frontal sinuses, and the patient has headache, or pain, or fulness in this region. Hoarseness supervenes, and by the laryngoscope the larynx can be seen to be inflamed. The disease spreads along the trachea and bronchi if it have not earlier infected them; and then there is tightness or stuffiness of the chest, quick respiration, and on auscultation the signs of bronchitis. Very often the state of bronchial catarrh appears so early, that it looks as if all the mucous surfaces involved were attacked at once. It may be conjectured that sometimes the alimentary membrane thus suffers, for pain in the epigastrium, nausea, and vomiting are not uncommon. But measles should always be regarded in reference to the air-passages. One other portion of mucous membrane is of momentous importance—that lining the Eustachian tube and tympanic cavity. Deafness often appears early, but much more serious ear-symptoms may be present. Numerous cases of permanent deafness are to be traced to this cause.

Scarlatina is by far the most important disease of this class in relation to sore throat. The connection between the angina and the exanthema has only been established in modern times, and therefore we find the older writers speak of the eruption as part of malignant sore throat, putrid sore throat, ulcerous

sore throat, &c. The identity of many of these cases with scarlet fever is so obvious we shall not enter into the arguments. Suffice it to say, however, that, in our pride of modern progress, we are too apt to neglect such men as Fothergill and Huxham, who although unable to trace the connection of the diseases as we have, did undoubtedly hand down to us most accurate descriptions of the epidemics they witnessed, and whose works now remain, and will well repay attentive study.

Great variations are observed in the course of scarlet fever. Thus, in one case the skin disease is most manifest; in others, that of the mucous membrane. Occasionally the throat is the only sufferer. Again, we find measles and scarlatina exhibit a tendency to run into each other; and consequently a number of cases are grouped together which are in some points very dissimilar. The relations between these two eruptive fevers being very intimate, systematic writers have been put to no small trouble to lay down their differential diagnosis. The hybrid forms have been erected into a distinct variety under the name of *Rubeola notha,* Rötheln, or German measles.

In scarlatina, after rigors and pyrexia, the patient usually complains of sore throat, but not invariably, and the soreness is seldom in proportion to the mischief. There may be hoarseness or some variation of voice; hawking, but more often an unpleasant sensation, or pain in swallowing. The whole of the throat is of a vivid rose red, hot and tender. The tongue partakes somewhat of this state, partially dis-

guised by the fur of the fever, through which the enlarged papillæ project, giving it the appearance of "strawberries." Now and then the throat, though much affected, gives no pain; and the patient will declare, on your wishing to inspect it, that there is nothing the matter with it. The tonsils suffer to a very great extent; frequently the disease seems to be a malignant tonsillitis and pharyngitis. On the tonsils and over the palate and pharynx, thickened mucus may be seen, which gradually becomes firmer, and flakes of a membranous character, closely resembling the exudation of diphtheria, also appear. Some hold, indeed, that a process of deep true exudative inflammation occurs in severe cases, while others think this is only in epidemics of diphtheria. These flakes certainly consist of detached epithelium, mixed with blood and abnormal secretion of the parts, and they leave ulcerated or even gangrenous patches of mucous membrane. In this there is then a strong resemblance between the two diseases. Effusion into the submucous tissue takes place and interferes with deglutition, and sometimes with respiration, even before some of the other more serious changes occur. The nose and ears are both involved; purulent discharges pouring from both passages. The nose may be in some case occluded, or most offensive discharges may proceed from it, but in milder cases this part of the membrane often escapes. Whenever coryza appears it is far from a favourable sign.

The ear is much more likely to be affected from the pharynx. The inflammation spreads along the

Eustachian tube, and as in the throat the symptoms may vary from those of a slight sore throat to the most malignant, so here there may be merely temporary deafness or earache, or the inflammation producing these may increase so as rapidly to destroy the function of hearing, and spreading to the brain prove fatal. Scarlatina is one of the most common causes of otitis, otorrhœa, and permanent deafness. It is, perhaps, natural that in the anxiety for life in severe cases the ear should receive little attention; but in mild cases it is most desirable that practitioners should pay attention to the first symptoms of otitis, and even anticipate them; many lives might thus be relieved of the burden of deafness. In malignant cases, necrosis of the bones of the ear, and abscess of the brain may ensue.

Even in mild cases the salivary glands enlarge and become tender, and suppuration is threatened in the cellular tissue around them. The cervical glands may be similarly affected. Pain at the angle of the jaw, or stiffness should always excite attention, and swelling accompanying these will be a cause for anxiety.

In malignant cases rapid sloughing of the tissues of the throat may occur; then the glands and the surrounding structures in the neck are attacked; suppuration, ulceration, and sloughing of these tissues may follow. In the first case pus has been known to force its way into the chest; in the others the great vessels have been opened, and thus a sudden termination put to the case. Gangrene is the most serious form the sore throat can assume. Of course,

the symptoms vary according to the position in which the fearful changes are hurrying on.

It is plain from what has preceded that scarlatina may exhibit all the appearances of sore throat, and all its varieties, from a very mild up to a most fatal one; so that the physician has in this disease an extensive and interesting field for observation and comparison. The other differences are just as great, scarcely incommoding one patient, and soon destroying another by the fever alone. It is believed that in some cases the fever kills before there is time for a rash to appear, in others none exists. Probably many cases have a slight rash which is not observed; it may sometimes be found by searching, when friends are very positive no such thing can be seen. What is most important to remember is that the mildest form may rapidly put on the most malignant type. This renders it necessary *always* to be guarded in prognosis. A most innocent-looking hyperæmia of the throat in a person who has been exposed to the contagion of scarlet fever should be regarded with suspicion. If the tongue put on the characteristic "strawberry" appearance it is still more ominous. Yet such an attack may pass away rapidly and occur repeatedly in the same person. I have known medical men who always have this when attending cases of scarlet fever, and am myself prone to such attacks under these circumstances.

The consequence of the exanthemata are those of blood disease; secondary hæmorrhages occur; even purulent deposits sometimes form; the blood after death is semi-coagulated. The whole mucous mem-

brane shows the effect of the disorganisation. The heart, kidneys, and other viscera are softened, I have shown that otitis is very serious, both as to its immediate and more remote effects. Coryza of the most distressing kind, scarcely arrested by injecting the nostrils with powerful lotions, may cause as much suffering as more fatal complications. Hæmorrhage from the mouth or nose, indeed from any part of the membrane, or some other lesion of this tissue, may speedily terminate life. Gangrene of the lips may take place. Congestion of the brain or lungs may appear. The poison circulating in the blood seems to arrest the whole vital powers and disintegrate the living tissues; at least in malignant scarlatina, some death agency seems to penetrate every part of the system. Even in later stages the danger is not over. Convalescence is long before it is really established, and this is as true in the mild as in the malignant form.

Anasarca, or some other species of dropsy often seizes a patient who flattered himself he was well. In fact, *acute desquamative nephritis* is so frequent a complication, that some authorities look upon it as a part of scarlatina. The renal disease may appear during desquamation, and even before this should be watched for. There may appear sometimes albuminuria, as in other fevers; but here it is most ominous, and the urine should be examined carefully in all cases of scarlet fever at frequent intervals, even after apparent convalescence. With regard to our subject, the dropsy may affect not only the subcutaneous but the serous membranes, and sometimes the submucous tissue of the larynx. The health is always so shaken, that the

convalescent is susceptible of every morbific influence. Diseases following this or any of the exanthemata will consequently put on a more adynamic form, and require some modification of their treatment.

The sore throat of scarlatina does not often spread down the air-passages, but the larynx, trachea, and bronchi may all be involved, and when œdema of the larynx is produced, that becomes the most urgent symptom. The tonsils, when they have not been destroyed, usually remain hypertrophied.

The diagnosis of the exanthemata is so beset with difficulty, that I am tempted to repeat an observation I communicated in 1860, respecting their physiognomy. This, I believe, often affords considerable aid in coming to a conclusion ; indeed I have, on more than one occasion, predicted that the peculiar drooping would end in an eruptive fever, and the event has justified the prophecy. It is easier to point out at the bedside than to describe such a sign. The countenance looks heavy, dull, less intellectual than usual, especially in lively children. Seen from a distance, an idea of œdema or puffiness is conveyed, and a strong impression is produced of hebetude—a peculiar drooping. Strumous patients display this most distinctly. In measles this physiognomy is associated with and partially obscured by coryza or lachrymation ; in scarlatina it is simple and characteristic.

In respect to treatment, the indications are as various as the appearances. No class of disease exhibits better the necessity of keeping in mind general principles. The local affection, important as it is, and requiring so often topical applications, ought not

to engross the whole attention. The numerous complications need to be vigilantly watched for and appropriately met from the first, since in nearly every one the treatment is to be modified by its occurring during the fever, and according to the epidemic prevailing, or the prominent peculiarities. Long after the danger seems past, the utmost care is to be taken to avoid exposure and restore the health. Further details are purposely avoided, to impress more effectually the lesson that every case is to be carefully weighed in all its bearings, its salient points made out, its prominent features distinguished, and its complications duly considered.

CHAPTER XII.

SYPHILITIC SORE THROAT.

HERE we shall only describe certain diffused affections, leaving the more localised lesions to be considered in connection with the diseases of the several organs. One of the most common forms of syphilitic sore throat is the inflamed state of the faucial lining met with in the secondary train of symptoms. The association, already insisted on, of certain skin eruptions, with varieties in the affections of the mucous membrane, may be again referred to. Thus, with roseola, we meet with the dark red and purple of erythematous inflammation of the fauces, while the papular, squamous, and tubercular skin complications accompany the elevated and well-defined mucous patches. All the parts of the throat may suffer simultaneously or successively.

Ulceration is exceedingly common in syphilitic sore throat, often occupying at once the pharynx, tonsils, and velum. Great loss of substance may occur, perforation of the palate is a too frequent event, or adhesions take place, closing the natural passages between the posterior nares and fauces.

Tubercular and papular elevations, proliferations, and condylomata, occurring in the course of syphilis, differ very much in their effects, according to the locality they occupy. They are often removed by general treatment.

Syphilitic sore throat is constantly and intimately associated with diseases of the mouth and nose, having a similar origin. Lesions of the tongue are thus caused, which may be confounded with cancer. The diseases of the nose are occasionally very intractable, some of them closely resembling those of a non-specific nature. These affections may be either superficial or deep. Severe pain sometimes accompanies them, and great deformity follows, and their management exacts the utmost care from the physician. In other cases there is little suffering, but the annoyance is protracted, and the chronic disease leads to further mischief and much misery. Some further account of these diseases may be found in the author's papers on ozæna and syphilitic diseases of the throat, already cited.

The *treatment* of syphilitic sore throat, as well as the accompanying affections of the mouth and nose, must be both local and general. Even in mild cases, it is improper to rest satisfied with lessening local manifestations, and leaving a virulent poison to fester in the system; it will only reappear with redoubled obstinacy. At the same time, it is right to state that topical measures are of the utmost value, both in the mouth and throat. In the early stages, they are indeed less important, and may be simple; but, in the later ones, they are often necessary to the comfort, or

even life of the patient. Large perforations of the palate, for instance, such as seen in plate I., fig. 1. may be completely closed by judicious, persevering treatment; œdema of the larynx may be relieved by operation; the consequences of exfoliation of the bone may be greatly mitigated; but general treatment must not be neglected. In tertiary cases, iodide of potassium is the recognised remedy, but it is also efficacious at an earlier period. In rapidly destructive ulceration, it must be given in large and frequent doses. The quantity is to be measured by the effect on the disease, and the ability of the patient to bear it. A patient may be kept under its influence, just short of iodism, for a considerable period. To produce the full effect, it is desirable for the doses to be given frequently. It is idle to attempt to control the disease with two or three small doses a day. The object is to keep some of the salt continually circulating in the blood; and, as elimination is rapid, the doses must be frequent. Those who cannot tolerate the more commonly used drug can often take the now official sodium salt, and that in the same doses, although, weight for weight, it contains more iodine. (See p. 102).

Syphilis in the larynx and elsewhere will be further considered in future chapters, in connection with the diseases of the several organs.

CHAPTER XIII.

AFFECTIONS OF THE SOFT PALATE AND UVULA.

PROCEEDING with our plan, we now pass on to consider the several organs of the throat individually, leaving the remaining consequences of inflammation and other morbid processes which affect them to take their places as we proceed; but it will not be necessary to repeat in reference to each organ a number of observations which have been made as to conditions involving all in turn.

We have seen that the soft palate and uvula form a division, though an imperfect one, between the mouth and throat. The anterior surface of this structure is therefore open to inspection, which informs us respecting deviations in its form or colour, while its irritability is at the same time open to the test of touch. The mucous membrane in this part is thick, its epithelium being of the tesselated kind, and composed of several layers. It contains numerous mucous glands, but solitary follicles are not always to be found. The normal redness of the velum is uniformly spread over the surface, and of less depth than on the

uvula and arches. To see the posterior surface we must employ the rhinoscope, when it can easily be brought into view. Here the mucous membrane is thinner; the epithelium in the new-born child is ciliated, but soon acquires the tesselated character, the mucous glands are few in number, above the uvula there are none, and the solitary follicles are very variable. As to colour, it is necessary to remember the different lights by which the two surfaces are observed. The anterior arches are rich in mucous glands, but have no follicles, or only a few towards the base; but on the posterior arches they are frequently to be found, especially on their posterior aspect. The whole soft palate is abundantly supplied with blood-vessels, lymphatics, and nerves. Several pairs of muscles, which in health act in pairs, form a considerable portion of its substance. The form of the parts undergoes continual variation, besides which there are great differences of natural conformation affecting the breadth and height of the isthmus faucium. The physiological irritability of the velum varies to a remarkable extent in different individuals, one appearing to bear almost with indifference what another is quite unable to tolerate.

Congestion is exceedingly common in the soft palate, and may be either active or passive, primary or secondary. Increased redness in contrast with the surrounding structures characterises the active form which may be produced by any local irritant, and is sometimes seen as an indication of extra blood supply from enlarged left ventricle, &c. The blueish tinge of venous congestion may in like manner be brought

about by blood stasis from disease of the lungs or heart, or may be the result of numerous previous active attacks. Among the irritants in daily use must not be forgotten alcohol, tobacco and snuff, the former giving rise to conditions deserving the name "tippler's sore throat," the latter to "smoker's" and "snuff-taker's" sore throat.

Hæmorrhage may be the consequence of congestion or of inflammation, or may arise from wounds by fish bones or hard food, or may be the result of the hæmorrhagic diathesis. We see thus ecchymosis, hæmatoma, or bleeding. It is important to trace this to its source, as blood found on the palate may have escaped from the mucous surface at a distance, or may be a result of disease of neighbouring vessels, as aneurism of the internal carotid. Ice to suck, and other measures which will vary with the circumstances, will suggest themselves to the intelligent practitioner.

Anœmia, or *hypo-æmia* is very common on the palate, as an expression of a general condition of the system. In fact, this and other disturbances of the circulation are more readily observed on this sensitive membrane than on the cutaneous surface, or even the lips. At the same time it must not be forgotten that such changes may be very evanescent, suffusion and pallor chasing each other over the mucous membrane with a rapidity to which we are only accustomed in the blushing and blanching of the face from emotion.

Inflammation of the velum in all its varieties is so often only a part of the same disease in a more extensive area—a portion of inflamed sore throat—

that we may refer to previous chapters for its nature and treatment. All the forms of inflammation, acute or chronic, superficial or deep, catarrhal, phlegmonous or exudative, primary or secondary, local or general, may here find expression. Each may be confined to the velum, or attack a wider area, though the deeper the disease extends the less is its disposition to spread over the surface. It will be readily understood, that in a part so mobile pain is likely to be a prominent symptom; and as the part is so much used in deglutition the pain is greatly aggravated in swallowing. In many acute cases food is for this reason refused; and the saliva is allowed to dribble from the mouth, because the patient dreads to swallow it. Another prominent symptom is difficulty and pain in speaking, especially marked in the palatal sounds, so that the speech acquires a characteristic tone. In some cases we hear, instead of this, a nasal twang, through the velum being unable to properly close the posterior nares. Hawking, coughing, or any act involving movement of the velum is suppressed as far as possible, on account of the excessive pain occasioned.

Herpes sometimes affects the velum only, but more frequently extends over a larger surface.

Œdema of the velum, or arches, is rare as a symptom of a dropsical condition, but not so uncommon as a consequence of inflammation in adjoining parts. It may then be extensive, and is of interest, as, arising from such a cause, it may find its way into the larynx.

Ulceration may be mentioned separately, inasmuch

as certain forms are of special importance, on account of the danger of their perforating the palate. Active measures should be directed to avert this; and usually constitutional, as well as local, treatment, is essential. It is in syphilis the greatest danger is to be apprehended. When there is rapid destruction of tissue the most powerful caustics are often needed. Concentrated nitric acid, or acid nitrate of mercury, can be applied to the exact spot required if sufficient care be used. The common method of using a glass rod is rather dangerous, as a drop of the caustic may fall off in the mouth. A bit of cotton wool or sponge can be easily soaked sufficiently, and used with a suitable holder. It is important, where ulceration is suspected, to explore thoroughly with the rhinoscope the entire posterior surface of the velum and the arches, behind both of which we may often detect this process at an early stage, and thus be able to avert its ravages. Other points have been referred to under the various forms of ulcerated sore throat; and, indeed, all that has been said of the several forms of sore throat is to be applied more or less completely, to the soft palate.

Gangrene may begin in the soft palate somewhat as noma does in the cheek, and run a similar course. It has been observed during an epidemic of hospital gangrene and under some other circumstances. This is to be distinguished from gangrene resulting from intense inflammation, or appearing as a secondary local manifestation in scarlatina, &c., though all are sometimes included in the term gangrenous sore throat, and require supporting treatment from the first.

Atrophy is seen in old age, and after certain diseases. It is mostly met with in connection with the same state in the tonsils, and its origin is not well understood.

Perforations cause distress in proportion to their size and position. In the worst cases we may cover the aperture with a proper apparatus, so as to prevent the food passing into the nose; but in many instances we may diminish the size of the opening or cause it to close altogether, by a persistent use of remedies. The large perforation shown in plate I, fig. 2, was completely closed by such treatment.

Cicatrices often remain, but are of little importance.

Tumours.—Morbid growths are not common, but when they occur may impede deglutition and require operation. Papillomata are the most frequent, but other formations have been met with. Cysts occasionally are formed by retention of the contents of the mucous glands. Sarcomata and other tumours now and then originate in the soft palate, but more frequently spread to it from surrounding organs. This is also true of

Cancer, which, though it attacks the velum by extension, seldom begins in it, and still more rarely forms secondary deposits. The end is often hastened by hæmorrhage or starvation. Sometimes asphyxia is produced.

Syphilis is usually symmetrical, and may put on any of the forms it assumes on any mucous membrane. The tonsil is generally attacked first. In the mildest catarrhal form it cannot be recognised by the appearance alone, but mucous patches are charac-

teristic. When ulcers are deep there is danger of perforation, and great loss of tissue, as in plate I., fig. 2. Cicatrices of various forms, contractions, and adhesions follow.

Nervous Diseases.—Paralysis is most common after diphtheria, but may occur from other causes, either alone or in conjunction with the same lesion in other parts, *e.g.*, the facial muscles. It may be partial or complete and affect some or all of the muscles. The paralysis may be central or peripheral, or arise in the course of the nerve. It is seen also in progressive muscular atrophy, and in labio-glosso-pharyngeal paralysis.

Spasm is but rarely seen, and little is known of its causes. Anæsthesia frequently accompanies motor paralysis and may also be produced by certain drugs, such as cucaine and the bromides. Neuralgia and hyperæsthesia are occasionally met with. The treatment of all these nervous affections is to be conducted on general principles.

Congenital malformations often admit of surgical rectification.

THE UVULA

is but a part of the velum, and therefore liable to participate in all its lesions. We need not therefore repeat them, but specify one or two points in which it has characters of its own. Its substance is chiefly made up of mucous glands, with a little muscular and connective tissue. The mucous membrane is rather

loose, and sometimes it slips in advance of the organ so as to form a prolapsed extension. We sometimes see inflammation of the uvula without anything else being involved—uvulitis. This is not often observed, since the affection is only trivial. The results of active or passive inflammation do, however, trouble the medical man. Of these œdema is an example, a common one, a troublesome one, one easily relieved, but very often not detected for some little time. The swollen and flabby state consequent on œdema requires no description. The symptoms will correspond with the increase of size and the irritability of the parts. It may look like a flabby, distended, reddish tumour, as large as the thumb, but it is generally seen in connection with the same state on the soft palate. The fluid may have to be let out by a puncture or incision, an operation of a simple nature, but requiring an expert hand to do it well. Ecchymoses and hæmatomata often appear, but are absorbed or only leave a stain.

Elongation is the term usually applied to the chronic relaxed uvula. Astringent gargles may be tried, but it will often be necessary to resort to the knife. Complete excision is attended with no evil consequence, and is strongly advocated by some in opposition to a partial removal. Others, however, still recommend snipping. This is easily done with well-constructed uvula scissors; but there is certainly something in the objection that the excised surface does not look backwards, as when skilfully removed by my sickle, an instrument exhibited at the International Medical Congress, 1881. Hypertrophy

or enlargement of the uvula, as distinguished from elongation, implies increase in all directions. I have seen it as large as a man's thumb, and hard and unyielding, as if a dense deposit of connective tissue had occurred. In these cases, nothing less than excision will succeed in removing the symptoms it may provoke.

It is important to recognise the liability of the uvula to these conditions, in order to prevent errors. Practitioners who never inspect the throat unless it is complained of, may often be lulling fear in the midst of danger, or exciting alarm without due cause, and in either instance losing reputation. The uvula-cough, as it has been called, is peculiar, and may often be recognised by its quick and ineffectual hack; yet not always. It is for the most part worse at night, or when the patient lies on his back. Often he is woke up suddenly with the sensation of being choked, even when he takes a nap on the sofa. Catarrh, relaxation, dyspepsia, want of tone, &c., are sure to aggravate the symptoms. The peculiarly troublesome cough sometimes gives rise to pains in the chest; and in long-standing cases, many of the symptoms of consumption may be assumed. Dr. Stokes declares he has seen all the symptoms of phthisis, except physical signs, thus produced. Further, neglected conditions of this kind may even rouse up to activity pulmonary disease, which had otherwise long lain latent. This is the less to be wondered at, inasmuch as a strumous diathesis is a most powerful predisposing cause of diseased uvula—an observation which will be of value in deciding on constitutional treatment.

When rapid destruction of tissue takes place, as in the course of sloughing, or syphilitic ulceration, the uvula may be consumed by the process, or it may be perforated (plate I., fig. 2), or be separated by the destruction of its base, and fall off, amputated by the morbid process; it may be more or less involved in any of the diseases that affect the velum. Now and then a polypus or other tumour finds its seat on the uvula. Warts are rather common in this locality.

Paralysis of the *azygos uvulæ* is sometimes complete, and, if unassociated with a similar lesion elsewhere gives no information as to the seat of the disease. When only one side is affected the organ is turned up on the other side; when both sides are involved it hangs down and simulates in an exaggerated degree the conditions we have spoken of as elongation and relaxation, in which there is, no doubt, some paresis as the result of previous inflammatory action. *Spasm* can hardly be spoken of as a disease, nor can increase or decrease of sensation; but it should be observed that the physiological irritability of this process varies as much as—perhaps more than—that of the rest of the soft palate in different individuals. In all, however, it can, with care, be brought to tolerate the contact of the laryngoscope if properly and steadily held.

CHAPTER XIV.

AFFECTIONS OF THE TONSILS.

ON looking into the throat the tonsils may easily be seen snugly ensconced between the anterior and posterior pillars of the fauces. In size and shape they have been compared to almonds, and have therefore received the additional name of *amygdalæ*, but their appearance varies much in different persons. Sometimes they are nearly round instead of oval, and almost globular rather than flattened. The fact is that perfectly normal tonsils are rare, and should be looked for in the infant before its first catarrh. A very considerable variation in size and shape may be admitted within the range of health. A little more than half an inch long and one third of an inch wide is considered a fairly full size, but a much better idea is to be derived from the relations of the parts. Thus the tonsil in health usually projects beyond the anterior pillar towards the median line, but the posterior pillar passes a little beyond the tonsil in the same direction. The lacunæ, from twelve to sixteen or twenty in number, are lined with epithelium continuous with that on the surface. The tonsils m

regarded as agglomerations of follicles composed of reticular tissue, containing a few capillaries and round cells. A quantity of firm connective tissue forms a strong framework, and supports the vessels, for there are arterioles between the follicles and veins around them. To the outside of the tonsil and closely attached to it is a dense aponeurotic structure, which limits the growth in that direction. Beyond this lie the great vessels of the neck. The nearest—the internal carotid artery—is usually quite half an inch distant, but occasionally it curves inwards, and lies along the fibrous separation, a fact of the utmost importance in reference to the danger of wounding the vessel when operating in this locality. The external carotid is about one-fifth of an inch outside the internal.

Inflammation, acute or chronic, superficial or deep, may attack the tonsils, or spread to them from neighbouring parts. The latter course is more common in catarrhal inflamed sore throat, when, if the tonsils become more affected than any other part, they may give their name to the attack, tonsillitis, amygdalitis, angina tonsillaris, cynanche tonsillaris, &c. This inflammation of the mucous membrane covering the tonsils may creep along the lacunæ, there is then more swelling, and a perverted secretion escapes from the openings, or may be penned up and produce deeper inflammation, or small abscesses like those seen in acne; on the other hand, it may dry up and leave concretions behind.

In acute phlegmonous inflammation the symptoms, both local and general, are much more intense. Only

one tonsil may be affected, or both may be simultaneously attacked, or the second may begin to swell just as the first is getting better. Very often there is simultaneous inflammation in the soft palate or one of the pillars.

The pain and swelling in acute parenchymatous tonsillitis are both marked from the first, and increase rapidly until perhaps no solid food can be taken, and fluids are swallowed with difficulty. There is high sympathetic fever, which sets in early, often even before much pain is felt. It begins with distinct rigors, and if already sore throat be complained of, it may lead to a suspicion of scarlatina or other more serious disease. The fever goes on concurrently with the local disease, exhibiting all the characters so often described as sympathetic or inflammatory fever. The pulse is full and frequent, 120 or more. The temperature rises rapidly to 102°, 103°, 104°, and even 105°. There is severe headache, thirst, furred tongue, and, after a time, but not necessarily, anorexia. Occasionally in weakly persons, or in children, delirium occurs, but in the latter this is more frequently replaced by convulsions. The local lesion runs a rapid course. In a few hours the swollen tonsils, where both are attacked, may meet in the median line, where they sometimes press each other so firmly as to cause ulceration, or where they imprison the uvula and cause it to inflame, or to adhere to some part of the surrounding structures. Sometimes the swollen tonsils press more forwards, pushing the inflamed velum and arches before them. If only one be affected, the protrusion is of course only on one side;

in either case it may be so painful for the patient to open his mouth, that it is difficult to obtain a view of the parts. This acute pain is aggravated by pressure at the angle of the jaw, where there is often considerable swelling of the cellular tissue. The parts in the neighbourhood are also sometimes swollen. The pain frequently darts along the Eustachian tube, when earache is complained of, and inflammation may spread along the same channel and give rise to serious mischief. On the other hand, deafness is sometimes present from an early stage. The pain may be so intense on attempting to swallow, that patients allow the saliva to run from the mouth, and when they do swallow the act is usually accompanied with grimaces or curious movements. Even speaking aggravates the pain so much that the patient is glad to keep silence, and when he tries to say anything his speech is observed to have acquired a peculiar nasal twang, or it may be thick, and as it were smothered or reduced to a lisp or noisy whisper, the various tones depending on the degree of interference with the function of the pharynx.

When the inflammation is thus intense suppuration occurs early. If near the surface the abscess soon spontaneously bursts, when all the symptoms speedily subside. If it be deep there is longer delay, which it may be desirable to abridge by the lancet. No doubt it was to tonsillitis running this well-marked course and ending in abscess that the word cynanche was first applied, and our own word quinsy, which, like the French *esquinancie*, is derived from the original, is usually applied, and should be restricted

to such cases; but the suppuration is only the result of phlegmonous inflammation, which may subside without the formation of an abscess. We may distinguish abscesses formed in the connective tissue surrounding the tonsils; they are most common in that which is packed between the tonsil and the anterior arches of the side affected; for this form is perhaps most often unilateral, though the opposite side frequently follows suit. The appearances here are such, that the disease has been thought due to lesion of the arch or velum, the swelling of which may quite conceal the tonsil. If the abscess occupy the posterior part it will, on the contrary, be more prominent. Clinically these cases comport themselves like abscess in the tonsil, and may be included in the term quinsy.

Notwithstanding the pain and distress caused by the disease, there is scarcely any danger to life, and after the crisis recovery is as rapid as the invasion and march of the malady. Nevertheless, in bad constitutions the evacuation of the pus is now and then followed by ulceration and sloughing. Moreover, there is a liability to recurrence of the inflammation on slight exposure, rendering it desirable to take measures for the prevention of repeated attacks. Some persons are so prone to tonsillitis that they suffer from it with every cold in the head until they are subjected to radical treatment. Others never have a second or perhaps third attack. The disposition to disease of the tonsils manifests itself at an early age. In childhood catarrhal tonsillitis is common—quinsy or abscess rather rare. With increasing

years the latter becomes more frequent, so that it is regarded as a disease of youth and the early half of adult life.

The treatment of acute tonsillitis is the antiphlogistic diet and regimen. As to the former, the unhappy sufferer has no alternative but a bland fluid diet; often he is compelled to starve, and that when he has a keen appetite. Of course the utmost care must be taken to avoid cold currents of air, or anything likely to aggravate the attack. Bleeding is not needful, in spite of all that has been said in its favour. Leeches are constantly ordered with a success which satisfies many: the author does not recommend them. Scarification is a more effectual mode of treatment. It empties the engorged organs of blood which is doing harm, and only harm; it diminishes the tenseness, and so relieves the pain. When adopted at the right time it seems to arrest the disease in many cases, and renders it milder in others, but it is to be carried out carefully and with a definite object. The minute superficial incisions made for this purpose differ entirely from that made for the evacuation of pus. In quinsy the abscess should be opened before too much mischief is done, or too much suffering needlessly endured. It is, indeed, maintained by some that it is always better to allow the pus to escape spontaneously; but while deprecating too early, and therefore useless or injurious incisions, I abide by the practice inculcated in my first edition, ever since which I have felt called upon, from time to time, thus to afford my patients relief and save them much unnecessary suffering. It is freely ad-

mitted that many abscesses, perhaps the majority, burst before it becomes imperative to lance them. In opening an abscess in the tonsil, the point of the knife should describe a course inwards as well as backwards, on account of the position of the carotid artery.

At an early stage it has been thought the attack might be arrested by the local application of cold. The sucking of ice is sometimes agreeable, and can then be fairly tried, and to this cold compresses have been added. It sometimes happens, however, that these remedies aggravate the pain. They must then be laid aside; and it will also be well to relinquish their use as soon as it becomes obvious that suppuration must ensue. Warmth should then be resorted to, and from the first is frequently found most grateful. The neck may be wrapped in flannel or cotton wool, and fomentations may be used at intervals. In addition the most soothing remedies are anodyne inhalations and mouth washes—gargling usually being too painful a process.

Purgatives, diaphoretics, febrifuges, and counter-irritation in turn enter the phalanx of most practitioners. The only remark the author would make about them is to beg his readers not to punish their patients by too much treatment. As a diaphoretic it is well to choose one that is also anodyne, for which purpose Dover's powder is often employed, and entails the use of purgatives and salines. It is generally better to choose a medicine which, though equally effective, is without this disadvantage.

Aconite has proved the best drug in the author's

practice. It is safe, pleasant, efficacious, and allays the fever at the same time. It rapidly reduces both temperature and pulse, and has also a powerful local effect. It can be given when other medicines are a great cruelty. Even if sucking a lozenge is too painful, or swallowing impracticable, it can be applied to the mouth with a camel-hair pencil—tincture diluted with water or glycerine. Salicylate of soda has been largely employed, especially by those who consider there is some relation between rheumatism and tonsillitis.

M. Velpeau eulogised the application of powdered alum with the finger, and considered it capable of arresting tonsillitis. It is not used much now, though other remedies are sometimes applied in the same way. Dr. Giné Partagas, at the International Congress of Hygiene (Geneva, 1882) lauded the use of carbonate of sodium in this way which in the initial stage, he believed, would arrest the attack if applied five or six times at intervals of five minutes. The nausea which might be excited, he said, was not bad as the contraction of the palatal muscles favoured the evacuation of the follicles. To be successful the treatment must be at the very first onset—before fever or swelling are perceptible. Yet he holds that two or three such applications a day will bring on resolution of hypertrophied tonsils—a view repeated at intervals for many years past, but which has not obtained much confidence. A similar claim has been made for lemon juice and other applications —absorbent, astringent, alkaline, &c.

Guaiacum, recommended by Sir T. Watson, the

late Mr. Harvey, and others, is believed by many to exercise considerable control over tonsillitis. The thick mixture often prescribed is particularly inapplicable when there is great swelling and tenderness. It can be replaced by tincture or by other preparations. Guaiacum is frequently employed in rheumatism, and it may therefore be supposed to be more suitable in cases of rheumatic sore throat than in tonsillitis. The same may be said of the salicyls.

Attempts have been made to arrest quinsy by the application of nitrate of silver, a strong solution being painted, or the solid stick, rubbed over the parts. It adds to the misery of the patient a most nauseous taste, and the necessity of hawking and spitting until the superficial slough it produces has been removed; it often fails to arrest the disease, and has too frequently been applied at a period when such a hope must be futile.

Emetics have been asserted to have the power, if given early, of completely arresting the attack. They are not popular, and I think seldom successful in the object, and should therefore be left to optional use by patients who are subject to frequent attacks. As, if the disease pursues its course, the patient will be deprived of food for some time, it seems a strange preparation of his system to empty the stomach of that which it contains. Of course, if digestion be not much affected at the time, he can take food soon after the emetic, which should not be depressing—salt or mustard may be selected.

An emetic is sometimes given for another purpose, to burst an abscess by the compression to which it is

subjected in the act of vomiting. It is more painful than the knife, or even than pressure with the fingers, but some persons much prefer it in repeated attacks. If there be a large quantity of pus collected it does not in this case run into the stomach, which sometimes happens when the abscess opens spontaneously; and as it is often highly offensive, provokes nausea or vomiting. Of course an emetic will be useless for this purpose until the abscess is quite ripe, and even then it may fail to accomplish the desired end.

An opening into the trachea has been spoken of as advisable when suffocation seemed imminent, but this will only be requisite when inflammation has extended to the larynx and brought on œdema—an event which is very rare, and completely alters the aspect of the case.

Ulceration, sloughing, or even gangrene may supervene. Instead of an ordinary inflammation, we then have to deal with a deadly disease—*tonsillitis maligna.* As the destruction of tissue generally involves other parts, putrid, malignant, or gangrenous sore throat, are terms under which we have described such cases. These should be compared with the exanthematous and exudative forms. It should be remembered, too, that syphilitic ulceration is peculiarly prone to commence on the tonsils.

Chronic tonsillitis often succeeds the acute form. In infancy it frequently takes place without any previous acute attack being noticed; or it follows a series of colds, in which, no doubt, superficial tonsillitis has occurred. If the lining of the lacunæ be affected, this is most likely to occur. Its causes,

symptoms, and treatment naturally partake of those of the acute or sub-acute, but in a modified form. Local treatment will be useful, but the constitution is generally much at fault. Dyspeptic ailments must be rectified, and where struma is prominent, as it so often is, iodide of iron, or cod-liver oil, will be found most valuable.

Lacunal or *follicular tonsillitis.*—The catarrhal inflammation is, very apt, as already shown, to extend along the lacunæ; and it may be confined to them, especially in the chronic form. We then have perverted secretion of various composition, either escaping from the openings or, if these be closed, retained in the tubes. The contents may be greyish, opaline, yellowish, or brownish. The accumulation may be fluid, or its consistence that of treacle; or it may become solid—these variations depending partly on the time it is retained. It may be composed almost entirely of epithelium, or contain pus corpuscles, or crystals of cholesterine or earthy matter. The last may be increased to such an extent that the concretions have been termed calculi. We may add that in these situations, as elsewhere, the imprisoned secretions have contained bacteria. When the contents of the lacunæ can escape we see thickened secretion, white or yellowish, coming away in moulds, and being renewed just like the comedones so frequent on the face. Sometimes these plugs are mistaken for other diseases; just as semi-solid condensed follicular secretion has been mistaken for patches of false membrane by persons on the look out for diphtheria. Sometimes they are offensive, and impart a sickening

odour to the breath. When the openings are quite closed these cheesy masses, or a more fluid secretion, may accumulate and distend the lacunæ until two or more communicate with each other. The result may be a cyst; or, if the concretion be solid, it will have the shape of the cavity it has occupied. Of course an abscess may at any time result, giving rise to one form of quinsy; or several single lacunæ may suppurate, and, if small, simulate acne. More commonly, there appears to be enlargement of the tonsil, but its true tissue is really diminished, and replaced by the accumulation. There is, in fact, atrophy of the tonsil which looks so large. I have dwelt thus at length on the inflammation of the lacunæ, because this form of tonsillitis, especially chronic, seems little understood; and some of its results have lately been spoken of as if they were unrecognised conditions. It may be well to add that some of these conditions may occur from any cause of obstruction at the orifices of the lacunæ; and, therefore, without inflammation, although this is commonly present at some stage. The treatment of such cases should be adapted to the conditions found, and may therefore embrace much that is appropriate in acne, comedones, cysts, or abscesses elsewhere. At the same time an effort should be made to induce healthy action of the mucous surface. Further, it should be remembered that the chronic inflammation which exists is likely to give rise to repeated attacks of acute or sub-acute tonsillitis, both catarrhal and parenchymatous.

Hypertrophy, enlargement, induration, are terms applied to a state which often results from inflammation, either acute or chronic. It frequently follows

a series of attacks of sub-acute superficial inflammation; but it sometimes takes place without this process appearing to precede. The ailment then goes on so slowly that when at length it is discovered, it has made considerable progress. This is most common with children. A peculiar snore during sleep, a thickness of the voice, some difficulty in swallowing, at length attract attention. Deafness in some degree is common. This has been considered the effect of obstruction of the Eustachian tubes; but congestion of their lining, induced by the disease in the neighbourhood or spreading along the mucous surface must be a more active cause. All the symptoms are often aggravated by a cold, and a chronic cough of a teasing kind persists. The consequences of considerable enlargement of the tonsils are not always so slight as these. The constant impediment at length betrays itself by impressing a peculiar physiognomy on the little patient, whose face looks small in proportion to the body, and whose nostrils often look pinched or sunken. The palate and dental arches are developed unequally. Deglutition and even respiration are impeded; although the breathing may be for the most part calm, yet it is usually accelerated, and spasmodic dyspnœa often occurs, Laryngotomy has even been performed to save suffocation in one of these fits. Obscure as the complaint sometimes is, and trivial as many may deem it, it is by no means undeserving attention.

Hypertrophy of the tonsils should lead the practitioner to suspect a strumous tendency, and while the child is growing up is the time to employ judi-

cious means for the establishment of the strength. We are also to remember that acute tonsillitis is more liable to occur when any enlargement exists, and that then the consequences are so much more serious. Other diseases occurring at such a time are increased in fatality; scarlatina especially. It is therefore a vital error, or unpardonable carelessness, to induce parents to look upon such a state as of no consequence. It is quite true that a strumous child with enlarged tonsils may acquire a more vigorous habit, and lose his ailment, especially when he can get sea air and bathing, with good diet; but this is no excuse for telling mothers that their children will outgrow a disease, the existence of which is a proof that they have a constitution liable to sink under the process of growth, rather than to spring up into unusual health. We have not yet stated all the evil enlarged tonsils may do. Not only does this complaint sometimes simulate consumption; probably it may arouse that dire disease into activity. Such a fear should not seem exaggerated, when it is remembered that hypertrophy of the tonsils is one cause of pigeon-breast. On this point Mr. Shaw collected important evidence.* The fact that the two conditions were frequently associated had long been known. The impediment to respiration preventing the lungs from filling with each breath, the external pressure of the atmosphere causes the walls to yield where the resistance is least, and thus produces the pigeon-breast. Such is the explanation approved by Shaw, Dupuytren, Pitha,

* *Medical Gazette*, October, 1841.

and others, who also hold that the deformity frequently diminishes after removal of the diseased organs.

With these circumstances in view, few can object to the operation for excising largely hypertrophied tonsils. Yet we are not to rush into the other extreme, and declare all enlarged tonsils fit for removal by the knife. Again do we repeat, the constitution is at fault, and constitutional treatment is the *sine quâ non* of beneficial practice. The patient must be got into good health, and then if the effect of a clearly morbid growth is obviously injurious, excision is to be resorted to. Much has been written in favour of and against this operation. It has been tried extensively as a cure for deafness—with results varying with the nature of the cases operated on. The late Mr. Harvey* opposed it for several reasons, one of them being that the tonsils are not merely secreting organs, but exercise important sympathies in the economy. My own observations on this point seem to bear him out. Another reason he assigned, that the mucous membrane is extensively affected, also fully coincides with the views expressed in this volume. I apprehend, however, that few will deny the necessity of the operation in such cases as those in which it is recommended above, just as other more important members are removed when their disease acts injuriously on the patient. If the health be greatly improved, slight enlargement may thereby be cured. Local treatment, especially repeated scarification, or interstitial injections, or cauterisations, may

* "The Ear in Health and Disease." London, 1856.

remove moderate hypertrophy. In numerous cases it is advisable, in others necessary, to take away the growth which is doing serious mischief, and although less radical measures are sometimes the only ones permitted, they are tedious and more painful than excision. A portion sliced off is an effectual remedy, as the remainder of the tonsil shrinks within the pillars, and the cure is complete. When this is done, it is to be remembered that one symptom of the constitutional derangement is henceforth unobservable, and a closer watch is therefore to be kept on others.

A strong, short-bladed, probe-pointed bistoury, with a slighter curve than usual, or one of my sickles may be employed. The operator ought to be ambidexter. The condemned tonsil is drawn forwards and inwards, and so much as may be wished is easily sliced off. The cutting edge of the knife is to be turned away from the carotid artery. It is by no means necessary, and seldom advisable, to take away the whole tonsil. About as much should be left as the healthy size of the organ. Some operators always use the guillotine, and in young children or timid patients this is convenient. If both tonsils need excising they may both be done at the same sitting. This plan has the advantage that there is only one period of soreness before complete recovery. No food should be taken for two or three hours, and it is often well to take only soft substances for a day or two. I have, however, seen a child eat heartily within two hours, evidently feeling no inconvenience. Occasionally hæmorrhage may be troublesome, but it

is usually restrained by tannin; if not, pressure with the finger should be applied to the wounded surface. If the bleeding mouth of any enlarged vessel were seen torsion could be tried.

Attempts at enucleation have been made, but in simple hypertrophy we have seen how needless is such a proceeding. Ligatures and *écraseurs* are objectionable; powerful escharotics painful and uncertain; nitrate of silver, though often employed, is not likely to accomplish its object. The galvano-cautery may do this, but even that is not to be compared to the skilful use of the knife.

Atrophy of the tonsils has been mentioned as taking place after abscess or operations, and also as occassionally being actually present when there is an appearance of hypertrophy.

Cysts, concretions, and other conditions have been discussed in connection with inflammation of the lacunæ.

Syphilis constantly attacks the tonsils. Erythema may be mistaken. Mucous patches are more characteristic. Ulcers on these bodies are always suspicious, especially when both are attacked at once without prior tonsillitis. Constitutional remedies must be employed as well as local.

Cancer very rarely begins in the tonsils, though it spreads to them from neighbouring parts.

SYMPATHY BETWEEN THE TONSILS AND OVARIES.

The effect of disease of the tonsils on the general

health has already been noticed, but a word or two more may be said on the sympathy of these bodies. Many years ago I first laid before the profession* the history of a case in which there appeared a strong sympathy manifest between the tonsils and the ovaries; stating that case to be one of several under observation. Dr. Gray soon after published† a case in point. Dr. Charles P. Knapp‡ has recorded a case which may be compared to these, though the parotid, not the tonsil was affected. At five successive menstrual periods, his patient, æt. 20, suffered from attacks of pain, tenderness, and fulness in the right ovarian region, complicated with an affection of the parotid gland, which enlarged, though without pain, in one attack and subsided in the next. After the fifth attack (May, 1878) no recurrence took place.

Such cases seem too numerous to be considered as mere coincidences, and suggest that some intimate sympathy more readily recognised than explained must be at work. Many may say that they merely indicate an interesting physiological fact or nervous sympathy. Yet if they meet with the association as frequently as I have done, they will be pleased to anticipate the complication, rather than to be confounded by its occurrence in a more than commonly marked form. The fact that metastasis takes place from the parotid to other glands, and even to the brain, may be considered as somewhat allied.

* *Med. Times and Gazette*, Sept., 1859.
† *Ibid*, March, 1860.
‡ *Philadelphia Medical Times*, August 30, 1879.

CHAPTER XV.

AFFECTIONS OF THE PHARYNX.

THE musculo-membranous bag, which is called the pharynx, is placed behind the larynx, nose, and mouth, and in front of the spinal column. On each side run the great vessels of the neck. It is said to reach from the basilar process of the occipital bone to the fifth cervical vertebra, ending in the œsophagus just behind the cricoid cartilage. It is thus about four inches and a half long. Its walls are made of mucous membrane, outside this a fascia, very tough above, but less dense as it descends, and outside the fascia the constrictor muscles, whose office it is to force downwards the food, which the act of swallowing places in their power. The mucous membrane varies in colour and thickness. At its junction with the Eustachian tubes and nares it is very fine. Here its glands are very numerous. A mass of these bodies runs along the back of the fauces, from the orifice of one Eustachian tube to the other, and here, therefore, we should look for disease. Yet there are many other follicular and racemose glands. In the upper pharynx, which can only be seen by the rhinoscope, the membrane looks

redder and moister than below. It is, too, thicker and less movable above. On the roof the mass of adenoid tissue which we have mentioned. as sometimes called the pharyngeal tonsil, may be discerned in the mirror, and the longitudinal ridges in which it is arranged made out. In the fossæ of Rosenmüller, and in the neighbourhood of the Eustachian orifices, the same tissue also prevails. Above, the epithelium is furnished with cilia, but lower down they disappear, and it assumes the squamous form.

Inflammation.—Acute pharyngitis is not very common, if the term be restricted, as it ought to be, to inflammation affecting the walls of the pharynx only; but this again is constantly involved in the various forms of sore throat which have been described. The localised affection may be acute or chronic, catarrhal or phlegmonous, and may result in any of the consequences mentioned when treating of a more diffused inflammation. The interference with functions will be proportionate to the severity and localisation of the disease. Thus dysphagia—difficult or painful deglutition, is an accompaniment of acute pharyngitis. If the Eustachian tubes be involved, there will be either deafness, or, on the other hand, noises in the ears, tinnitus, or ear-ache. If the nares are implicated we have stuffiness, or coryza, with nasal voice. Instead of this the inflammation may be confined to the lower part of the organ, and is then apt to extend to the larynx. Catarrhal cases are mostly brought on by "catching cold," and these are seldom confined for any length of time to the pharynx. The characteristic changes produced in the early

stage are redness and swelling, and the extent of these can be determined by the rhinoscope, which also enables us to discover localised pharyngitis in the parts inaccessible to ordinary inspection. Increased and perverted secretions, with other changes, succeed, and give rise to various appearances.

Phlegmonous pharyngitis is often traumatic. It may be set up by swallowing hot or irritant or caustic liquids, when traces of the agent may be left on its path ; or fish bones and other solids may be arrested in their passage, and give rise to slight or serious injury. Fatal results have occurred from pins, bits of bones, or pointed bodies, perforating the walls and penetrating other parts. Some difficulty may be experienced in deciding whether the foreign body remain in the pharynx, or only the injury it has done give rise to a sensation as if it were still present. The laryngoscope will discover very small bodies in various situations and guide us in the use of instruments to remove them, after which the inflammation is to be treated on general principles.

Chronic Inflammation may succeed the acute or sub-acute form, or may commence insidiously ; or may supervene on congestion arising from interference with the circulation, local or general. It is extremely important to differentiate these latter cases, which are sometimes subjected to topical treatment of a most useless or injurious kind. As in acute, so in chronic pharyngitis, the inflammation may implicate the whole surface, or be confined to special districts. One of the localities most prone to suffer is that portion of the posterior wall which is visible on ordinary inspec-

tion, but the discovery of disease in this part should not satisfy the physician, as the morbid process frequently occupies a larger area, the extent of which can only be defined by rhinoscopic exploration. The posterior pharyngeal wall is most exposed to the contact of irritants. At the same time it is here that the mucous membrane is least sensitive. Hence in this locality, inflammation manifests itself with less intensity, but more persistency. Often it will linger here long after it has disappeared from the rest of the throat, So obstinate does it sometimes seem, and so little effect do remedies sometimes exercise, that the most powerful applications have been recommended. It is well, however, to remember that chronicity is a natural feature of the case, and, therefore, very vigorous measures, even such as may be dangerous, cannot cope with the condition which is, nevertheless, amenable to steady perseverance in prudent but rational treatment.

The congestion in chronic pharyngitis varies with the origin and course of the disease, as well as with the general condition of the patient. It may be active or passive, the membrane may be of uniform hue, florid or livid; or the colouration may occur in patches; or vessels—arterioles or venules—may be seen coursing over the surface. Sometimes the coarser veins become varicose. There may not be any considerable degree of thickening uniformly over the surface, but the glands and follicles are very apt to become hypertrophied. The epithelium increases in patches, and sometimes puts on an appearance which might be mistaken for exudation. The increased

secretion, too, becomes dry and hard, and may cause similar appearanccs; or it may form an adherent thick lining, tough and leathery, whitish, brownish, yellowish, or greenish, and sometimes most offensive, Much of these offensive secretions descends from above, but some is formed here, and may be so closely adherent that its removal leaves a breach of surface. Instead of this, hæmorrhage may result from the congestion when it is rather more active. Œdema too is now and then seen.

As the disease is often provoked or kept up by local irritants, the avoidance of these is of great importance. The tippler's sore throat is a good illustration of this, but much more obscure causes may sometimes be traced. The most useful local treatment is by pharyngeal douches, succeeded by sprays, but it is also necessary to pencil the parts with astringent or other liquids. In regard to congestion brought on by constitutional states, or interference with the circulation, the physician should give his patient the needful advice, and only in exceptional circumstances, or to afford temporary relief to urgent symptoms, make local applications. Even in these cases sprays or lozenges may suffice.

Granular pharyngitis is only one form of the follicular or granular sore throat already described, but it is the most obstinate. Though when taken early it may often be restrained, if neglected it will proceed—slowly but surely—and generally torments its victims for a long period. Ulceration of the follicles succeeds the earlier stages. All kinds of local treatment have been recommended, from the mildest stimulant or

astringent gargle up to the galvano-cautery. The most generally used, and too often abused, is nitrate of silver. It is easy to apply—either in solution to the whole membrane, or fused on a probe to touch the individual ulcers. It is often resorted to unwisely. Tincture of iodine, or a solution of this drug in glycerine, may in many cases advantageously replace it.

Ulceration, tubercular, scrofulous, and syphilitic, have been considered in a previous chapter.

Pharyngitis sicca is the condition on the posterior wall, which we have called "dry sore throat." Instead of increase, we have diminution of secretion, and instead of thickening, a thinning of the mucous membrane, which looks like a varnished surface. It is smooth, dry, tense, and shining, often so thin that the muscular tissue beneath shines through and lends it a deeper colour, otherwise it may be less red, or even brownish or yellowish. It is an atrophy of the membrane; depressions caused by follicles, which no longer exist, may be observed, and the glandular tissue throughout the pharynx is much diminished. It seems closely allied to, if not identical with, a condition met with in old age, and sometimes it supervenes on long continued inflammation or follicular disease.

The symptoms may be slight or severe. In this, and other respects, dry resembles granular sore throat. Mild applications, even bland ones, are most successful. Demulcent lozenges and confectionery are almost always tried by the patient, but there are more effectual and non-irritant remedies suitable for sprays, douches, and occasional pencillings.

Hypertrophy.—Instead of the atrophic process described in the last paragraph, we meet with the opposite condition. Hypertrophy of the mucous membrane may be general throughout the pharynx and nasal passages. It is then difficult to detect. It may be more local, when it is easily discovered. The epithelium may increase in thickness, showing discoloration, with perhaps elevated papillæ, the secretion being more copious. The glandular tissue increases still more remarkably, giving rise to roundish prominences, polypoid growths, folds or ridges, and other projections. The connective tissue is at the same time increased. The vessels may be dilated; the acinous glands enlarged and occasionally converted into cysts.

The treatment of hypertrophy, like that of atrophy, should be directed first of all to the underlying condition, which is almost always chronic catarrhal inflammation. To promote retrogression we resort to general treatment of the constitution. Scrofulous and underfed youths seem most liable to hypertrophy, but it sometimes attacks others. Local stimulant applications of nitrate of silver, iodine, and other substances hasten the cure. In aggravated cases superficial scarification may be tried, or the growth may be destroyed by galvano-cautery, or operative procedures undertaken. The last are by no means without danger, and are only justifiable in extreme cases. Considerable masses have disappeared under persistent constitutional and local treatment. Atrophy has set in after long use of douches and sprays with occasional applications of nitrate of silver.

Polypi.—The various growths found in the pharynx may be mentioned. Nasal polypi may descend from the nose and be seen here. The so-called naso-pharyngeal polypi grow from the periosteum covering the base of the skull. Then we find other forms of tumour both benign and malignant. Cancer of the throat usually begins in the pharynx, and almost always involves it.

Pharyngocele may be confused with tumour. It is a pouch formed by a dilatation of the outer coat in which food may accumulate and be pressed out. Rumination has been noticed in such a case. The disease originates in rupture of the lining, or ulceration through it. It may be sometimes made out, by external pressure causing the tumour to disappear, and a sound may be introduced into it. Perhaps pressure applied and some stimulant, such as iodine, might cause it to close if the patient were fed by a tube. More severe measures have been proposed.

Emphysema is sometimes produced by air finding its way through an aperture into the cellular tissue. It has occurred during catheterism of the Eustachian tube. Dysphagia and change of voice direct attention to a condition rapidly spreading, but easily arrested by snipping the uvula or incising the soft palate and other accessible parts.

Œdema has in the same way been produced in injecting the middle ear.

Syphilis simulates various conditions. Its ulceration has already been named, but it is necessary to add that in the pharynx it may put on any of the appearances which it assumes on the rest of the

mucous membrane. We must, therefore, always be prepared for its occurrence, and, when found, direct the treatment accordingly.

Retro-pharyngeal abscess.—Behind the pharynx is a quantity of loose connective tissue, connecting its walls with the prevertebral fascia. This is sometimes the seat of abscess, giving rise to some anomalous pharyngeal symptoms. It may occur at all ages, and many patients have died with it undetected—some, even when it has been suspected. The symptoms are at first those of pharyngitis, afterwards of suppuration. Where this sequence is observed, and the shivering is marked, most careful search should be made. The swelling may sometimes be seen bulging forwards from the posterior wall; but if it is situated lower down, as is often the case, the finger must be passed as far as possible, and may detect it. This is often the only means, as in numerous cases the disease occurs in young children. Stiffness in the neck, and spasm, with difficult deglutition, should, in infants, lead to an examination for abscess. If found, and accessible, there only remains for it to be opened, which, with great care, may usually be safely done. It occasionally bursts, and discharges its contents before it is discovered. If suspected, but incapable of being found, an emetic might possibly burst it. This abscess may originate in an erysipelatous inflammation, but more often it is a symptom of disease of the vertebræ. In either case, the pus has mostly an offensive odour. I have met with a case in an adult, which had caused great trouble, but remained undetected for a long period. I opened

it, and after discharging a large quantity of offensive pus, the patient completely recovered. The late Mr. John Adams had a case, caused by a piece of fish-bone becoming impacted between the vertebræ. Of course, when caused by caries of the vertebræ, as it too generally is, the treatment resolves itself into the management of that disease.

Nervous affections.—Hyperæsthesia is more common than, perhaps, is suspected, and neuralgia may present itself. On the other hand, anæsthesia is not often met with, except as a sequel of diphtheria, in combination with paralysis, which lesion may, however, occur in other circumstances. Dysphagia is the first symptom of paralysis. The patient, finding some difficulty, will adopt singular attitudes to assist in deglutition; then he finds either he cannot swallow at all, or the aliment returns through the nose. Solids seem to find their way more easily than liquids, so long, at least, as the paralysis is not complete. Particles are apt to get into the larynx. Labio-glosso-pharyngeal paralysis should be discriminated. Spasm should also be recognised as sometimes affecting the pharynx.

The treatment of hyperæsthesia should be distinctly sedative. The bromides are often of use. Locally, salts of cocaine may be applied by pencillings or sprays. The paralytic affections should be treated in accordance with the principles of electro-therapeutics; but neurotic medicines are sometimes of great use.

CHAPTER XVI.

AFFECTIONS OF THE NASO-PHARYNX.

THE upper part of the pharynx, which is only visible in the rhinoscope, is called the naso-pharynx, or naso-pharyngeal cavity, and constitutes clinically a tolerably distinct division. To save repetition, it may be stated that the morbid processes we have been studying in the pharynx may all occur here, so that the following remarks should be compared with those in the last chapter.

Hyperæmia.—Congestion in the upper pharynx not unfrequently gives rise to hæmorrhage, the extent of which depends on the condition of the parts. When considerable, some of the blood usually comes from the nasal passages, which are particularly prone to bleed. In small quantities, blood is frequently mixed with the secretions from the upper pharynx. Congestion due to general diseases also occurs in this locality, and gives rise to hæmorrhages and to increased secretion.

Inflammation may be acute or chronic, catarrhal or phlegmonous, and its symptoms are usually well marked. The remarkable increase and perversion in

the secretions can only be understood by bearing in mind the laxity of the membrane and the copious blood-supply of the parts, circumstances which also explain the abundant hæmorrhages frequently met with. In the same way the redness and the swelling are both well marked, though the latter may be sufficient to disguise the former.

The swelling which occurs in this region in acute catarrhal inflammation may easily be mistaken for more permanent hypertrophy. In a severe cold in the head the mass of adenoid tissue on the roof of the pharynx, which has been called the "pharyngeal tonsil," may be an inch and a half thick, and the longitudinal ridges may appear, to any but a skilled observer, large enough to suggest more serious disease. In chronic catarrh, or in the state induced by a series of colds, the danger of mistake is naturally greater, especially if the parts have been cleansed from secretion by the douche, or otherwise. Of course, the appearances are often completely concealed by excessive secretions, which may be of various consistence, are often most offensive, and must be removed before any opinion can be formed on the state of the parts. Sometimes the redness is localised in patches, or is more vivid in one part than another. The anterior lip, and as much of this part of the wall of the Eustachian tube as can be seen, is both red and swollen in most cases; but the inferior part retains its normal condition, or is so little affected that the contrast is manifest. The swelling reduces the orifice, and makes it slit-shaped, but it never quite closes it.

Ulceration.—Erosions may appear on any part of the surface. Follicles swell up and suppurate, so that on rhinoscopic examination the membrane may look as if strewn with grey granules. Such follicles may unite and form abscesses, to which ulcers succeed, followed by scars. Both in consumption and in syphilis we may also have ulceration as well as other changes.

Cysts and cyst-like formations frequently occur; they seem often to depend on closure of glands lacunæ, or follicles.

Polypi and other tumours, fibromatous, sarcomatous, enchondromatous, or cancerous, may also occupy the naso-pharynx.

Hypertrophy is associated with, and seems the result of, chronic catarrh, and polypi are often present at the same time. The glandular tissue is specially increased and leads to important changes. The "pharyngeal tonsil" may become so much hypertrophied as to hang down over one or both of the choanæ, so as to interfere with the nasal respiration. Not only so, but the hypertrophy may involve all the glandular tissue in the naso-pharynx, and this cavity may in extreme cases be completely occluded. Both classes of cases are included in the term

Adenoid vegetation, adopted at the International Congress,* on the proposal of Dr. W. Meyer, of Copenhagen, who had several years previously† in-

* "Transactions International Med. Congress," 1881.

† "Hospitals Tidende," 1868. "Trans. Med.-Chir. Soc., 1870.

vestigated the disease. In the discussion, the glandular nature of these growths was generally admitted, but Dr. Woukes regarded them as papillomatous in their origin, and said he had never been able to trace anything like gland tissue in any specimen. It has always appeared to me desirable to discriminate so far as practicable cases which may fairly be described as hypertrophy of the pharyngeal tonsil from those in which proliferation of the neighbouring tissues is also involved. These vegetations may be hard or soft, brittle or tough, and differ much in their vascularity. They may be few and scattered, producing little effect, and easily amenable to treatment; or they may be packed closely together and from their position seriously interfere with respiration, impair the hearing, and produce the characteristic "dead" speech, with other symptoms. It is important not to mistake for this disease the swelling already described as occurring in simple catarrh, or the uneven and ridge-like appearance of the natural conformation. Rhinoscopy will usually clear up any difficulty, and in advanced cases digital exploration gives satisfactory information.

The treatment of naso-pharyngeal diseases has been greatly advanced by the use of the rhinoscope. Inhalations and fumigations find access to this cavity, and in acute cases soothing remedies of this kind are most grateful. Sedative insufflations may sometimes be servicable. At a later stage, pencillings and sprays, or the nasal douche, will be required. Snuffs, injections through the nose, pharyngeal douches, and other methods of reaching this cavity, afford assistance.

By the aid of the rhinoscope local applications may be made to ulcers or other diseased points. Operative procedures are required for the removal of extensive growths. These I carry out by any of the methods which have been advocated, the selection depending on the exigencies of the case. Naso-pharyngeal polypi sometimes require formidable surgical operations, and too often recur. Adenoid vegetations, if few and scattered, are often amenable to other treatment, but when extensive must be removed. I cannot subscribe to the doctrine that they must be completely extirpated or are sure to recur. On the contrary, much less formidable operations than are often insisted on suffice, and especially if followed by suitable after-treatment.

CHAPTER XVII.

CONNECTION OF SORE THROAT WITH AFFECTIONS OF THE NOSE AND EARS. THROAT DEAFNESS.

WE have seen in the last two chapters that diseases of the pharynx and naso-pharynx are closely related to those of the nose and ears. In catarrh, in hypertrophy, in polypi, and in other affections, the nose may be obstructed and the breathing thus interfered with; or discharges of a copious or offensive character may be set up, as in ozæna; the delicate sense of smell may be injured or destroyed; the nasal passages at any point may be inflamed or ulcerated; and other diseases may supervene—on the one hand exceedingly painful, on the other so intractable and annoying as to make the patient a burden to himself and friends In all such cases the passages should be carefully explored by both posterior and anterior rhinoscopy, and when once the cause of the disease is discovered the resources of rhinoscopal therapeutics may enable us to cope with it.

So it is in affections of the ear. Besides the numerous cases commonly called throat deafness there are many instances of loss of hearing which are

caused by the conditions previously passed in review, and can be relieved by the application of similar principles. Thus, over and over again, we have had to speak of deafness as caused by disease in the organs we have been considering. Other conditions, depending on the connection between the ear and the throat—some frequent, some rare—have also had our attention. Moreover, besides impairment of hearing, we may meet with increased sensitiveness to sounds, and other impressions—more or less painful. Ear-ache, tinnitus, singing or noises in the ears, giddiness, and other distressing symptoms cannot be successfully encountered by confining attention to the external and middle ear, while these parts may be permanently injured by the local action set up in more general diseases, as we have seen, for example, in the exanthemata. The study of aural diseases, while working with my late friend Mr. Hinton, impressed upon me the necessity of investigating the connection between the throat and ear.

When the Eustachian tube is patent, the density of the air in the cavity of the middle ear is affected by every change of atmospheric pressure in the naso-pharynx, whence may arise changes in the function of hearing. This pressure is affected by gaping, coughing, sneezing, and other variations of respiratory movements. When the tube becomes closed, whether by secretions, or by the swelling of its walls, or by pressure without, the enclosed air is too rarefied; whence falling and increased tension of the membrane of the drum and the chain of bones. With nothing further than this, it is easy to see the hearing may be

impaired, or even abolished, or other functional disturbances may ensue—such as pain, or unpleasant sensations, or noises. If these conditions last, congestion or inflammation, with swelling, effusion of liquid, or other changes in the tympanic cavity may follow with still more grave results. It should be remembered, too, that when from any cause the nasal passages are occluded, rarefaction of the tympanic air is caused every time the patient swallows, and this may give rise to deafness, which may be due to disease in the naso-pharynx, in the nose, or in the ear itself. Pain in the ear, especially on swallowing, is more likely to be caused by the throat disease extending into the Eustachian tube.

Œdema and escape of blood into the tissue may also close the orifice of the tube, while the hypertrophic changes, and new formations described in previous chapters, may any of them produce the same result. Hypertrophied tonsils do not, as some have supposed, press together the sides of the Eustachian tube—for the anterior lip of that tube is too firmly adherent to the pterygoid process—neither does a swollen or hypertrophied velum close the tube in this way; but both these affections may set up disease of the mucous membrane extending along the tube, and that deafness is common at some period of their progress must be familiar to every observer. So with regard to polypi, they may stop the tubes by their size just as they obstruct the nose, or they may set up disease of the orifices, or they may so hang as not to interfere with the openings, and leave the hearing unaffected.

In atrophic processes the reverse obtains. Thus in "dry sore throat," if the disease be of long standing, it may extend in the same direction. It is not generally known, but is none the less true, that such a condition may give rise to various symptoms connected with the ears. This state may be diagnosed by the rhinoscope, and what is of more importance, the instrument may prevent erroneous practice and save the patient from serious injury. It is in such cases that nasal douches are most likely to injure the ears.

The effect of neuroses may be seen in the fact that we meet with both spasm and paralysis of the tubal muscles. These, however, are conditions which are only likely to be appreciated by those who have carefully studied diseases of the ear. Dr. Woakes has lately suggested an explanation of the mode in which some other nervous influences are concerned in the production of aural symptoms.

Foreign bodies are often put into the nose; sometimes they gain access to the naso-pharynx; occasionally they have got into the Eustachian orifice. In all these cases, common sense as well as special skill are required to remove them with the certainty that no damage shall result.

CHAPTER XVIII.

AFFECTIONS OF THE ŒSOPHAGUS.

TURNING now from the upper to the lower extremity of the pharynx, we find it connected with the gullet, an organ which many will think is scarcely included in the word throat; but inasmuch as its diseases have certain definite relations to those described in previous pages, and the author has had unusual opportunities of observing them, he has thought that some remarks based on his experience may be acceptable, more especially as these affections are universally pronounced to be among the most difficult to detect and deal with.

The mucous lining of the œsophagus may be attacked by any of the morbid processes we have described as affecting the pharyngeal membrane; but in the gullet the likeness of mucous membrane to skin, on which we have insisted, is more strikingly exemplified than elsewhere, and its diseases are modified in accordance with its structure. Inflammation, acute and chronic, catarrhal, follicular, phlegmonous, exudative, erosions, ulceration, hæmorrhage, hypertrophy, morbid growths, and other changes may take place here, all of them interfering more or less with

nutrition. The œsophagus may also be affected by diseases seated in the trachea, bronchi, aorta, or other neighbouring organs, while each of these may in turn suffer from morbid processes originating in the gullet.

Inflammation.—In acute catarrhal œsophagitis pain is not a prominent symptom, but may be felt along the course of the tube, especially in swallowing. In chronic cases it is less likely to be described. There is no doubt hyperæmia, but it is not visible, and the condition described in many text books is purely hypothetical. The thick epithelial covering protects the part, and to this structure is due the different appearances. What we really get is a kind of desquamative inflammation, and in the few cases in which inspections can be had, softening and thickening are marked features. The membrane looks opaque, of a dull white colour, and rather dry, for excessive secretion is not present. A layer of thick mucus may indeed be found, but then it will be seen that the glands are involved. Phlegmonous œsophagitis is best studied in traumatic cases, especially those set up in swallowing hot, acrid, caustic, or corrosive liquids. In small-pox pustules may form along the tube.

Ulceration.—Erosion may result from catarrhal inflammation, and be followed by small, shallow, but well-defined ulcers: these never seem to extend to the deeper layers, but traumatic ulcers such as occur from the impaction of foreign bodies will cause perforation. Follicular ulcers may be differentiated, for though the follicles here are few, they may inflame and then ulcerate; such ulcers can only be distinguished by their position.

Exudation seldom invades the œsophagus. In diphtheria the disease scarcely ever extends below the pharynx, but now and then it has done so.

Hypertrophy of the mucous membrane is the characteristic of chronic inflammation, and it has been so localised as to cause a kind of stricture. Increase of tissue also leads to

Morbid growths, of which epithelioma is the most frequent and the most important. These growths cause impediments to the passage of food, which begins to "stick fast in the way," and this symptom increases until there is complete stoppage. This and other forms of stenosis are often included under the term

Stricture, which is therefore said to be simple or malignant. Spasmodic stricture is also recognised, and must be carefully separated: we include it in the neuroses. Stricture in the wider sense of the term may also be caused by pressure from without, as in aneurism of the aorta and other tumours.

Dilatation, or pouching, is another distinct condition caused by any obstruction below the pouch. It may arise from all the coats of the œsophagus being distended, or from some of the muscular fibres allowing the mucous membrane to pass between them. In either case there is impediment to the passage of the food, of which, however, a portion is retained for a time in the pouch, and afterwards regurgitated.

Foreign bodies find access to the œsophagus. Among these may be mentioned parasites; the oïdium albicans of thrush invades the tube; so does the trichina; ascarides, and other worms find their way from the intestines. A great number of substances

have also been swallowed and became impacted; for their removal various instruments have been designed, all of which should be used with the greatest care. In some cases œsophagotomy has had to be resorted to.

Neuroses.—Paralysis is one of the sequelæ of diphtheria; it is seen in the later stages of general paralysis of the insane, progressive muscular atrophy, labio-glosso-pharyngeal paralysis, and other neuroses; it also seems sometimes to occur independently; it is simulated in hysteria. When incomplete, we often observe that liquids are less easily swallowed than solids.

Spasm occurs more frequently; to it is perhaps due the sensation of constriction in swallowing, which troubles many nervous people, and the *globus hystericus*. It may proceed so far as to prevent deglutition, forming a spasmodic stricture, which is characterised by its sudden access and complete intermission—very different from the steady advance of organic stricture.

The symptoms, course, and results of affections of the œsophagus are, it will be seen, very various, and their diagnosis, prognosis, and management attended with the greatest difficulties. Yet by bringing to bear upon their study the knowledge of morbid processes elsewhere, and taking into consideration the peculiarities of the organ affected, we may it is submitted, shed light on these obscure diseases, and do much to alleviate the sufferings they cause.

Pain, as we have seen is not necessarily urgent; in some cases it is scarcely felt, in others it is constant, and generally dull; when acute often due to secondary causes. Dysphagia is the most constant symptom:

any interference with the ease of swallowing may be so called; it may be only an undue consciousness of the act of deglutition, felt in most of the diseases; it may be an uneasy sensation, or a feeling of heat or burning, or pain thus set up, as in œsophagitis; it may be a difficulty in completing the act, as is common in paralysis; it may be a sense of the morsel sticking fast at some defined spot, as frequently occurs in stenosis. These, and other characteristics of this symptom, are full of interest, but do not suffice for diagnosis: we therefore resort to physical signs. Percussion and auscultation are both of service. The latter has been systematised by Hamburger, whose conclusions, however, seem to be too arbitrary; we are, nevertheless, indebted to him for a considerable advance in this respect, as shown by an abstract of Oppolzer's lectures, translated by Dr. Clinton Wagner, for the author's Reports on diseases of the throat.*

The sound or bougie is of great importance for diagnosis, but must be used with the utmost gentleness; by it we estimate the diameter of the tube, determine if contraction exist, and if so to what degree; the sensitiveness of the mucous surface throughout is also thus manifested; pulsation may be propagated along the instrument; on withdrawal it may bring with it mucus, pus, or blood. In malignant disease the bougie may be stained with blood when it has been so carefully used as to seem scarcely to touch the diseased spot. The tissues often possess so little resistance that there is no slight danger of injury

* *Medical Press and Circular*, vol. xiv., 1872.

being done. Even in non-malignant cases force is not to replace manipulative skill which is as essential in the œsophagus as in other passages.

Treatment.—Only some general indications, such as naturally result from what has preceded, need be laid down. The use of demulcents is general in irritation along this tube. Anodynes may often be advantageously added, especially in acute œsophagitis. In chronic inflammation and in ulceration astringents are often advised, but their utility is not unquestionable. If parasites be present some of the liquids which destroy them can, perhaps, be slowly swallowed. In dilatation, when the food is retained, the use of antiseptics is a comfort to the patient, provided they are not too nauseous; boracic and salicylic acid are therefore suggested.

In stenosis we have to determine whether external pressure or intrinsic disease gives rise to the stricture. In the latter case we may try mechanical means. It is true that lamentable accidents have occurred even to able operators, but, with extra care it is to be hoped they may be less frequent. The bougie need not, therefore, be abandoned, and used with the utmost gentleness in appropriate cases, may prolong life as well as diminish the patient's distress; further, in some cases the success may be still greater. The author's experience includes many cases in which he has been glad to resort to the bougie, but not one in which he has had cause to regret it. The bougie may also be used to convey medicaments to the part, as also may the instruments I exhibited for this purpose

at Cambridge,* August, 1880, and again at Cardiff,* August, 1885. These instruments comprise bougies of several shapes, from No. ½ catheter guage to the full size of the œsophagus; tubes for feeding in stricture, No. ½ to No. 12 catheter; tubes for feeding through the nose, extra soft and flexible, with terminals to fit hypodermic syringe, from smallest size, and graduated from this upwards; and instruments for conveying medicaments to the seat of the stricture. These instruments which should always be of the most flexible kind and best quality, were made for me by Messrs. Maw, Son, and Co. When these methods fail, and in malignant cases, the recent advances in surgery promise us, at least, a prolongation of life.

In malignant disease, in aneurism of the aorta, and other conditions, mechanical treatment should not be employed. When such conditions are suspected, the utmost care is necessary in passing a bougie, even for diagnostic purposes. In some of these distressing cases our attention must be directed to maintaining as far as possible the nutrition of the patient, and alleviating his sufferings; but in others gastrostomy may be a proper and justifiable resource.

In the neuroses the use of strychnia, bromides, and other neurotics will be indicated, and the resources of electro-therapeutics should not be forgotten. In spasmodic stricture the gentle pressure of the bougie, if prolonged, often suffices to demonstrate the nature of the case, and seems even to assist its cure, but it should be followed up by proper constitutional remedies.

* Meeting of British Medical Association.

CHAPTER XIX.

AFFECTIONS OF THE LARYNX AND VOICE.

IN treating of the art of laryngoscopy, I have given a full description of the laryngeal image, and a brief general account of the variations in the view produced by disease. In the present chapter these changes will receive their practical application. First of all, changes of colour are most easily appreciable, and, at the same time, as increased redness is characteristic of all congestive diseases, most frequent. There may, however, be diminution of colour or pigmentation. Each requires a few words.

Anæmia, or *Hypo-æmia* of the larynx, is met with as an item of a general anæmic condition, however produced. After profuse hæmorrhage, or in convalescence from various diseases, it can be well studied. It may also be due to local defective nutrition, and I have shown its significance among the earliest symptoms of consumption.

Pigmentation may take place in various states, and may be general or localised to a small part of the membrane. The yellow discolouration of jaundice and the bluish tinge of cyanosis may be named

among the former, but care should be taken in drawing conclusions when using artificial light. Ecchymoses and varicosities are to be seen sometimes, and the stains of blood or secretions coming from this or any part of the membrane; also stains produced by the substances swallowed may affect this part, as mentioned when speaking of gargles. The possibility of inhalations and sprays producing discoloration is now and then forgotten, and ludicrous mistakes have occurred from this cause. Another source of accidental discoloration is breathing an atmosphere loaded with impurities. Soot, dust, and the products of factories may be named. Miners' melanosis may be mentioned here.

Hæmorrhage may be traumatic, or may arise from ulceration or other solution of continuity, and occasionally appears when no ruptured point can be detected. I have seen it produce very anomalous symptoms; and if, as is usually the case, the amount be very slight, there may be a small clot formed, the nature of which at first is rather puzzling. A little ice to suck, and sprays of alum or iron may be desirable; but the principal indications must depend on the origin of the hæmorrhage, which may be an almost trivial symptom, or one of grave import. A small bleeding point has been seen on an inflamed vocal cord, as well as in other parts of the larynx. More copious hæmorrhage from the trachea and from the lungs may take place, and larger clots may sometimes form in the larynx.

Hyperæmia is common to the several congestive diseases. It may, however, be only a passing condi-

tion, a blush provoked by slight causes, or it may be more persistent, continuing for a long time without proceeding to laryngitis. When it seems to approach the border, it is often distinguished as

Congestion, which term is also frequently used to express a milder degree of inflammation. In the acute form, it is usually the result of slight irritation, such as over-exertion of the voice, or the temporary presence of foreign bodies. In the laryngoscope we often see a blush appear at the close of a prolonged note, especially a high one, and this may assist in the explanation of certain injuries which occur from over-straining the voice. In youths, whose voices are breaking, there is often persistent hyperæmia, which may be a key to the active changes going on in the organ, but which may become excessive. After a particle of food has gone the wrong way, and been expelled with some difficulty, especially grains of salt or condiments, congestion may last several hours. Passive congestion may be induced by violent paroxysms of cough following such an accident, or set up by disease—*e.g.*, whooping cough. Chronic congestion of a passive kind is seen when the venous circulation is retarded, as in some forms of asthma and heart disease.

INFLAMMATION.

Formerly the description of laryngitis naturally embraced the superficial and deep forms, as well as the œdema, which is often superadded. The

distinctions between them have been so completely established by the laryngoscope that I now deem it proper to divide the subject of inflammation into several varieties. These I shall describe from a laryngoscopic point of view, confining myself almost entirely to my own clinical experience.

Acute catarrhal or *Erythematous laryngitis* is the result of aggravated congestion, and may arise from any irritation to the mucous membrane, but in this climate is mostly due to "catching cold," and the causes of this are too well known for it to be needful to run over them. It is well, however, to mention certain specially injurious influences, such as going direct into the cold outer air after breathing for some time the hot and vitiated atmosphere of the theatre, opera-house, concert-hall or ball-room. The artists are specially liable to suffer from this, as they have been subjecting the organ of voice to a certain strain; so, though in a somewhat different manner, preachers, lecturers, and public speakers may be injured by exercising the voice in hot rooms, or in cold or damp buildings, or out of doors. In either case, over exertion, or the use of the voice when the larynx is already suffering, is still more prejudicial.

In the slightest cases there may be no pain, no cough, scarcely any uneasiness. A little mucus collects, and is expelled with a *hem;* and there is hoarseness, or, at the least, some change of voice, with fatigue on exerting it. Singers at once perceive the loss of purity in tone, though others may not notice it, and, but for the accompanying cold, would scarcely admit they were hoarse. With the laryngoscope we see

the mucous membrane to be unusually red, the false cords and posterior commissure being frequently most affected. A faint rosy colour of the posterior part of the true cords is often seen. In more severe cases, the uneasiness which prompts to clearing up increases to a feeling of itching, dryness, or even pain, and provokes a cough, which in its turn fails to relieve. Very little, if any, expectoration can be raised. The voice, too, is more affected—hoarseness of all grades may be present, or aphonia may ensue. Tenderness on pressure may be present, and febrile disturbance; but this last will depend more on the extent of membrane involved than on the position. The laryngoscope now reveals more congestion and swelling, with perhaps loss of lustre or cloudiness of the epithelial surface. As the false cords swell they approach each other and partially conceal the true cords, which thus look narrower. Their breadth may be reduced almost to a line in this way, and it is constantly reduced a third or half. At the same time their surface may become red, and small vessels may be seen upon them, or there may be ecchymoses. The membrane covering the arytænoid cartilages is specially prone to suffer, and we often see a pair of red globular swellings in this locality. These appearances may be studied in plate I, fig. 1., taken from an acute case of laryngitis. In the most acute cases of all, the swelling is so great and rapid that obstruction to inspiration becomes the one urgent fact, and unless it is relieved the patient is soon asphyxiated. In these cases there is generally œdema into the submucous

tissue. In the œdematous parts the swelling is paler, but the rest of the mucous membrane is deeply injected.

Laryngitis may form a part of the inflamed, exudative, exanthematous, erysipelatous sore throat, &c., in all of which the occurrence of œdema is a source of danger. Apart from this, dyspnœa, is not urgent in adults, but in children the mildest attack is likely to set up stridulous breathing and attacks of laryngeal spasm. The phenomena of false croup, already discussed, may most of them thus be due to slight catarrh. In these young patients, too, the cough is paroxysmal, and often accompanied by a loud stridulous inspiration, so that it resembles whooping-cough. On the other hand, it may be of a deep bass, buzzing character, perhaps due to vibration of the arytæno-epiglottidean folds. In adults, cough at first is hoarse; as the swelling goes on it loses its tone, and as soon as secretion is poured out becomes moist. The voice may be husky, hoarse, or completely lost, or the ability to utter certain tones may be absent, while others are within the patient's power. If the patient only speak in a whisper, it may be because of the pain caused by talking aloud, but real aphonia may be present. The hoarseness, or aphonia, is the result of interference with the functions of the vocal cords, and interesting questions arise as to how, in each case, this is brought about. No doubt the fine membrane of the cords may be so swollen as to considerably affect their vibration. So it has been thought that the swelling may interfere with the action of the muscles, which again, may undergo an alteration in their fibres;

while others think that the change of voice is usually dependent on deranged innervation. I think all these causes may be at work in different cases. Mechanical prevention of the movement of the vocal cords unquestionably takes place at times, the influence of the nerves is demonstrable, and the peculiar inequality of tone seems likely to be due to incomplete and unequal muscular action. The expectoration is at first scanty, sometimes it is streaked with blood, and now and then there is sufficient hæmorrhage to cause symptoms of fluid in the air-tube. Occasionally a firm clot has formed in the larynx in such a position as to be a dangerous impediment to respiration. Pain in swallowing is present when the epiglottis or the parts pressed upon by closing this valve are involved in the inflammation.

Œdema of the larynx may supervene in a slight case of superficial inflammation, and may speedily terminate life. If not relieved it will be fatal in a few hours, and cases are recorded in which no warning preceded death, which, therefore, may be termed sudden. As the infiltration takes place into the sub-mucous connective tissue, œdema might be called a symptom of phlegmonous laryngitis, but it is a condition so important as to deserve to rank separately as a disease; never forgetting that it may be superadded to any laryngeal affection, or indeed to most forms of sore throat. It is almost always a secondary affection. It is brought on by acute laryngitis in any of its forms, especially those caused by injury. Any form of traumatic sore throat induces it; scalds are almost always accompanied by considerable œdema. In the

throat affections of the exanthems and infective diseases, in all cases in which inflammation may spread from other parts to the larynx, we must also look for its occasional appearance. In deeper disease in the larynx itself, as perichondritis, abscess, &c., it is likely to occur. Besides these forms, there is a non-inflammatory œdema which may appear in the course of Bright's disease, or as the result of obstructed circulation, a veritable local dropsy; but this, too, is dangerous to life, in the same way as the more acute form.

Œdema derives its serious aspect from the locality in which it occurs. An infiltration which elsewhere might be trivial may here completely close the narrow air tube, and thus suffocate the patient. The symptoms are those of suffocation, or rather of obstructed respiration. Inspiration is most laborious, and accompanied by loud stridor. The patient makes most violent efforts to draw in his breath—he often feels as if something were present to prevent this. Expiration is easier, but in time this becomes difficult. If no relief be obtained, the agony of impending suffocation may close in a final struggle, or the patient may have a respite, to be followed by a similar paroxysm. Thus, even with permanent obstruction there is the same marked tendency to exacerbations and remissions observed in other laryngeal affections. The inspiration is difficult, because from the position of the parts the two swollen folds are drawn together by the stream of air, but in expiration they are pushed apart. When, therefore, the expiration is also impeded, it is because the swelling is increased, or the folds have become so distended as to be immovable.

This, therefore, denotes greater danger. If no relief be obtained, and the patient does not die in a paroxysm, the aëration of the blood is sufficiently interfered with to change the picture. The gasping and stridor may give way to delirium or coma, and the duskiness and lividity common to all forms of impeded respiration appear. The cough which was painful, and perhaps at first loud, becomes slight or suppressed, as the patient cannot properly inflate his lungs; or it is interrupted by stridor or gasping; or it is muffled or noiseless according to the interference with the vocal apparatus; and the same may be said of the changes in the voice. The arytæno-epiglottidean folds are almost always infiltrated, and not seldom the œdema is limited to them, occasionally to one of them, or one is much less affected than its fellow. The enlarged folds may be red, or rather pale, according to the tension, but the point is the swelling which transforms them into a couple of rolls or blisters, which approaching each other, narrow the opening of the larynx. The word blisters really describes the appearance of some of these swellings which instead of red or pink, are sometimes of a straw colour, and at the first glance might be said to be collections of fluid beneath the tense membrane—blisters. In other cases there is less tenseness, and so a red or rosy appearance. The epiglottis may be in a similar condition, and this valve may sometimes be seen on merely depressing the tongue. In other cases the false cords are the seat of the œdema; they then advance over the true cords, hiding them in proportion, and may meet in the centre and close the glottis

or when only one is affected, it may advance and cross over to the other side. In rare cases there may be infiltration into the sub-mucous tissue of the true cords, closing the chink of the glottis, but the membrane here is closely attached, and sets a bound to the œdema. Œdema below the cords is equally rare, but was admitted by Cruveilhier and Sestier. Since then, Gibb reported cases, and described some pathological specimens. Sestier saw œdema extend into the trachea, but only in seven instance out of 132 cases of laryngeal œdema.*

The laryngoscope informs us not only of the presence of œdema, but of its precise position and extent, enabling us to watch its progress, and to intervene at the right time. The examination must be skilfully and rapidly made, and care must be taken not to increase the difficulty of breathing by the position in which the patient is placed, or by prolonging the period of exploration. In children, and sometimes in adults, it may be desirable to introduce the finger, which may enable us to determine the position and extent of swelling, or the presence of a foreign body; but digital is necessarily inferior to ocular exploration, and, moreover, is very apt to provoke a paroxysm of spasm. Trousseau mentions a case which for some minutes he thought had proved fatal from this cause.

Phlegmonous laryngitis is met with in other forms. A distinct abscess may be formed, either as a result of injury, or in the course of perichondritis, which itself is a form of parenchymatous inflammation. Diffuse

* "Traité de l'Angine Laryngée Œdémateuse." 1852.

suppuration, though very rare, has been met with by Cruveilhier and Rokitansky. Diffuse cellular inflammation, accompanying purulent infiltrative erysipelas, is described by Ryland and Porter, and is to be distinguished from the erysipelatous sore throat, which occurs in facial erysipelas.

Treatment of acute laryngitis.—In mild catarrhal cases, the treatment advised in inflamed sore throat will suffice. If fever be present, aconite will restrain it, and soothing inhalations, succeeded by astringent sprays, will suffice for the local lesion. In many cases the disease may be cut short by pencilling with an astringent, or by the use of the atomiser. The former plan is, however, only to be resorted to in selected cases. In severe cases more active measures are called for. The first wish is to prevent œdema, and that involves arresting the inflammation. Some believe that venesection can do this, and on account of the urgency of the symptoms, bleeding has maintained its place in very acute laryngitis longer than in many other diseases. No doubt the circulation is temporarily relieved by the abstraction of blood, and the respiration seems easier. Krishaber advises blood-letting, and afterwards cupping in the neck, even when œdema is present. If bleeding be resorted to let it be early enough. As an antiphlogistic depressant, its one advantage is the rapidity with which its effects are produced. With respect to leeches, less difference of opinion exists, and as much may be said for counter-irritants, purgatives, mercury, and antimony. It is natural, in view of the urgent necessity of *doing something*, and the idea of

combating inflammation, that the practitioner should feel impelled towards active antiphlogistic treatment; but the results are little encouraging, as pointed out in the first edition of this work, when I ventured to solicit further attention to other methods. I then proposed keeping the patient in a hot, moist atmosphere, and urged, too, that anodyne inhalations should be more frequently used, and that chloroform was a justifiable remedy, which, though not to be given in a close-fitting inhaler, on account of the gasping for breath, could be dropped on a handkerchief or probang, and held near the mouth. I also recommended ice to be held in the mouth, a remedy which may be supplemented by cold compresses or Leiter's tubes to the neck. Rest to the inflamed organ is important. The effort to speak is too often encouraged by the friends, and when improvement begins, the physician's intentions are frequently frustrated by allowing talking, or by his directions in this respect being disregarded.

Many believe that the application of a strong solution of nitrate of silver will prevent œdema, if *applied in time;* and others think it may arrest its progress. It must be carefully applied by the aid of the laryngoscope. The very frequent, nay, almost constant use of sprays is less dangerous and perhaps quite as effectual. Trousseau recommended sprays of tannin or alum, and several cases have been reported in which the persevering use of these remedies saved the necessity of resorting to operation.

But if œdema be considerable, the natural indication is to make an opening for the escape of the

liquid. This can be effected by scarification, guided by the mirror which should be done whenever the obstruction to respiration becomes dangerous and is progressing. Incisions, not mere punctures, should be made, when the swelling will collapse unless the liquid be thick, and in such case it should be pressed out. This operation can be performed without the laryngoscope, but then it is comparatively a blindfold act. It was first done by Lisfranc before the era of laryngoscopy, and should not be omitted because a laryngeal lancet is not at hand. I have shown how the swollen epiglottis is sometimes visible on pressing the tongue well down. In such a case it could be scarified with a common bistoury, the edge being wrapped round with plaster or rag up to within half-an-inch of the point. A gum lancet might be used if at hand, or in the absence of a pocket-case, any knife or other cutting instrument which could be made to answer. So when œdema is not visible, it may sometimes be felt with the finger, and this may serve as a guide to the same improvised instrument. Any practitioner may suddenly find himself face to face with a case in which there is not a moment to lose, and in which this rude but ready method of operation may save life. I am, therefore, more anxious to impress its value on my brethren as a proceeding available in emergencies. A still simpler method, when practicable, would be to burst the blister by sudden pressure with the finger, as suggested by Stromeyer, or even to sharpen the finger nail to a point, and try with that, as proposed by Legroux, to let out the fluid. These suggestions have been smiled at—of course they are only available

when the œdema is within reach of the finger, and then it may extend much below, so that an effectual vent cannot be provided in this manner; but it may be worth while to make the attempt. It is possible the act of vomiting might rupture a tense swelling, so that in some cases an emetic might be useful, or tickling the fauces would be more rapid. Although I have dwelt thus on these rough and ready methods, I would have it understood that whenever the instruments can be had in time, the laryngeal lancet guided by the laryngoscope is infinitely superior. The laryngoscope changes this somewhat dangerous proceeding of groping blindly in the dark into a precise, safe, and sure operation. It is only, therefore, in emergencies that we should dare to dispense with its assistance.

If scarification give no adequate relief, and if in spite of all our efforts suffocation be impending, we have still a last resort in an artificial opening into the respiratory tube below the seat of obstruction. This operation is not to be delayed until all hope is gone, but performed as soon as other means fail to relieve the progressive dyspnœa. Furthermore, when apparently arriving too late it should not be omitted, some patients having been resuscitated from apparent death by the operation and artificial respiration. Should laryngotomy or tracheotomy be performed? It is no longer denied that the œdema does not extend below the glottis, therefore either operation will fulfil the indication. Prof. Stannus Hughes, in a lecture at the Royal College of Surgeons in Ireland, has ably summed up the arguments in

favour of laryngotomy.* The ease with which it can be performed, and its efficiency for the purpose, seem to indicate it as preferable to the more dangerous proceeding when the opening is only expected to be temporary. These, therefore, seem to be the cases in which it will be selected. In sub-glottic fibrinous infiltration tracheotomy should be performed.

CHRONIC INFLAMMATION.

Chronic catarrhal laryngitis may succeed an acute or sub-acute attack, or may be brought on by any of the causes of an inflamed sore throat, of which it often forms a part. It lingers after the rest of the mucous membrane is restored, or is kept up by the use or abuse of the voice, or by breathing a dusty atmosphere, or any irritation of the larynx. Singers, preachers, lecturers, teachers, hawkers, and others who are obliged to exercise their voices, are very subject to the disease, which also plays an important part in the processes brought about in the larynx by syphilis, consumption, and typhoid fever. The symptoms of chronic laryngitis necessarily may also be produced in the course of caries of the cartilages, or as the results of injuries, or by pressure on the larynx or trachea, as in goïtre, or by tumours involving or irritating the laryngeal nerves, as in aneurism. The symptoms may be so slight as scarcely to attract the patient's attention, or so severe as to run into

* *Med. Press and Cir.*, May 8, 1872.

sub-acute inflammation. It is the voice which furnishes the most striking change. There may be any degree of hoarseness, or in the mildest cases, only fatigue in speaking, or diminished purity of tone in singing may be noticed. Some hawking, or cough, and uneasy sensations, or even pain in the larynx, may be generally present, or only after exerting the voice.

The diagnosis is made by the laryngoscope, in which we can watch the course of the disease and the effects of remedies. Congestion is seen differing in every degree—a partial or general hyperæmia of pinkish hue, or of the deepest red, or livid. There is also swelling, and later on thickening. The inter-arytænoid fold, the false cords, and the edges of the true cords, especially at the posterior part, are most frequently congested. The swelling of the membrane in these situations interferes mechanically with the vibration of the cords, and thus the voice may be affected in various degrees. The cords themselves are sometimes deeply congested with or without the same state in the other parts. The epiglottis is also apt to be swollen and red. After a while thickening takes place: then there is further interference with function. The ventricular bands advance over the cords and restrict their movements. The cords themselves assume a granular or a muddy or dirty-red appearance, and their vibrations are less distinct, and perhaps irregular. Other motor derangements may be added, but these will occupy us further on. Erosion is not common, and ulceration so rare as a result of simple laryngitis, that many deny its occurrence. It is common in phthisis and syphilis,

but the chronic laryngitis of these diseases is so important that I separate it from the common form. Papillary excrescences, and even polypi, seem to develop from neglected catarrh.

Granular or follicular laryngitis is recognised by most, but not all observers, as a process similar to the follicular sore throat.

Hypertrophy of the mucous membrane similar to that spoken of in the upper pharynx, may also be seen. I am inclined to regard the thickening already spoken of as of the same nature, as well as the cases described by Türck as *chorditis tuberosa, and trachæoma of the vocal cords.* A more important hypertrophy is that which now and then occurs on the *under* surface of the cords, and gives rise to narrowing of the air-tube, on account of which tracheotomy has had to be performed, though in one case, recorded by Türck, the hypertrophy diminished. Rokitansky, who seems first to have noticed this stenosis, regarded it as the result of inflammation, and as having a constant tendency to contract.

Venous congestion may lead to a dilated condition of the veins. This is most common on the epiglottis, which is thus varicose. Dr. M. Mackenzie met with it in the larynx, and called it *Phlebectasis laryngea,** the distended veins running along the orifice of the ventricle, ventricular bands, and vocal cords. He regards it as constitutional, but Ziemssen and Duchek believe it to be the result of local inflammation.

Treatment.—The mildest forms of chronic laryn-

* *Lancet*, July 6, 1862.

gitis may be removed in the early stage by the use of astringent solutions administered as atomised sprays. But the cure will be more certain and rapid if pencilling with a stronger astringent be also employed. In more severe and more chronic cases these topical applications must be regularly employed, and it may be needful to increase their strength. The salts of zinc, alum, iron, copper, silver, and others are used of varying strength, according to the condition presented. When there is great irritability of the parts, or a sub-acute inflammation, inhalations—anodyne or simple—may be premised. In other conditions, solution of chlorate of potassium, and still oftener bromide of potassium, 20 to 30 grains to the ounce, used in the atomiser, will relieve the irritation, and promote healthy secretion. At other times, iodine fumigations are better. In still more obstinate cases, with thickening, a solution of nitrate of silver may be applied; or, instead of this, tincture of iodine, or a stronger solution mixed with glycerine. In the worst cases, solid nitrate of silver may be applied to the hypertrophied membrane by means of the laryngeal cauterising probe. Sometimes the resources of electro-therapeutics enable us to cope with this obstinate disease. Counter-irritation is sometimes tried, but I have more confidence in constitutional treatment, the judicious use of which will often add greatly to the efficiency of local measures. Some cases have been so long neglected, or so inefficiently treated, that the patients despair, and as soon as a little temporary relief is obtained no longer submit to the restrictions it is desirable to impose. They will drink mineral waters,

or go for change of air, but do not like to give up habits which aggravate their complaint, or persevere in treatment. The influence of a genial bracing climate is generally favourable, and therefore a winter in some southern health resort may be useful; but neither climate, baths, nor mineral waters should be resorted to until a thorough course of local treatment has been carefully carried out. Having spent several entire seasons in various winter health-resorts and summer spas, I have been able to acquire practical experience of the therapeutical value of climates and mineral springs, which I by no means undervalue, but am the more anxious that these influences should not be brought into disrepute by reliance upon them in unsuitable cases.

The fauces sympathise with the larynx, and often need treatment at the same time. Thus, while it is necessary to regulate or restrict the use of the voice, it is equally important to avoid all irritation of the throat, whether by alcohol, condiments, hot fluids, snuff, or other articles. Considering the differences imposed by diathesis, we should not neglect to attend to any constitutional indications.

When hypertrophy has become excessive, it may be found that it progresses in spite of all the treatment described. Then it may be necessary to convey more potent destructive agents to the part, but these require the utmost care and circumspection. Should the stenosis advance to the extent of hindering due aëration of the blood, tracheotomy must be performed.

PERICHONDRITIS.

We have seen that this is generally secondary, but as it may be traumatic, and as Schrœtter, Türck, and others have found it without a primary disease, while some think it may be due to rheumatism, we describe it separately. It is seldom recognised in its early stage, unless as a part of phthisis. With inflammation of the perichondrium comes an abscess which may point into the cavity of the larynx, or externally. The pus may be quite circumscribed, or may burrow: it is seldom possible to distinguish it from a more superficial abscess. The cartilage, deprived of its nutrition, exfoliates: parts may be loosened and escape, or be removed by operation, or suddenly blocking the larynx, suffocate the patient: or the dead cartilage may keep up a constant discharge of pus. Very rarely, after exfoliation, a spontaneous cure has ensued. The deformity of the larynx which results, usually contracts the tube, and according to the extent of this stenosis will the clinical picture vary. The duration of the case varies as much as the other features.

The utmost skill and patience are alike required in the progress of the disease. External abscesses should be opened early. It may be desirable to attempt to remove portions of the necrosed cartilage, and an early opening into the air-tube may be called for. Even in the most favourable cases the stenosis occasioned by the destruction of part of the framework of the larynx necessitates tracheotomy. Gene-

rally the unhappy sufferer is condemned to breathe through the artificial opening for the rest of his days though in this, and some other forms of contraction, excellent results have been obtained by mechanical treatment. Curious events occasionally happen, among which may be named the formation of a fistula between the larynx and the pharynx, on the one hand, or the external skin on the other; and the even more rare occurrence of emphysema of the tissues from the air finding its way into them through the opening formed by the abscess. The appearances in the laryngoscope present great variety and can scarcely be studied satisfactorily, except in connection with individual cases.

GROWTHS IN THE LARYNX.

Polypi, and other laryngeal growths, were very obscure diseases prior to the introduction of the laryngoscope. Now, not only are they readily discovered, but their several varieties can be distinguished, and they can be subjected to manipulation. In suitable cases they may be removed *per vias naturales*, and when this is impracticable, other operations may be resorted to. It has already been mentioned that out-growths are apt to take place in the course of chronic laryngitis, and this may perhaps be regarded as the chief cause of the benign growths. Papillomata are the most common of all neoplasms, and are found not only where the mucous surface is abundantly provided with papillæ, but where it is destitute of them.

Their form is very various: small proliferations of any shape, warty-looking bodies, and larger tumours, like grapes, mulberries, &c., are seen in various situations; often they are multiple, and occupy a large space; sometimes they assume a fringe-like form. Fibromata are frequent and often pedunculated. Mucous polypi and cysts are not so common, and grow slowly, while they can be treated by making an incision and cauterising the lining. Myxomata and lipomata are very rare.

Recurrence is common in papillomata, but not in fibromata, and contrary to what might be expected, cysts do not often relapse.

The symptoms produced by new growths of a benign character depend on their size, shape, and position; the course of them is regulated by the rapidity of the growth. There may be scarcely any indication of a small growth, while a larger one may block up the larynx to an extent endangering life. The diagnosis is made by the laryngoscope. The treatment depends on the circumstances. Small neoplasms may remain stationary for years, and not cause any inconvenience, unless in persons who professionally use the voice. Some of these even find them quite tolerable; but hoarseness, loss of, or change in, the voice may supervene. The vocal impediment may be only intermittent or occasional, according as the tumour interferes with the action of the cords. When the neoplasm is small and inactive, it may safely be let alone. When it increases it can be removed. Small growths may be got rid of by escharotics, of which nitrate of silver is

safest. The more potent caustics are only to be used with the utmost caution. Chromic acid is specially apt to extend its destructive power beyond the growth into the sound tissues. Galvano-cautery has been successfully employed. For mechanical removal, various knives, scissors, guillotines, snares, and forceps have been devised, and the operator must select for each case the method of extraction he deems most advisable. Thyrotomy can still be performed when the tumour cannot be extracted *per vias naturales.*

Prolapse of ventricle has now and then occurred, and is mentioned here as it has been mistaken for a neoplasm. Professor Lefferts, of New York, has recorded a case which is unique—prolapse of both ventricles. He had the gratification not only to diagnose the case, but, by a bold operation, to cure the patient.

Malignant growths.—Cancer may be primary in the larynx, or may extend to it from the pharynx, œsophagus, or tongue. Epithelioma is the most frequent form. It is not often observed in its earliest stage. Hoarseness may be the only symptom for a considerable period. Then shooting pains in the larynx are noticed, and after a while dyspnœa and other signs of an impediment to the free passage of air, with further vocal changes. The laryngeal contraction increases until it is necessary to perform tracheotomy. Difficulty and pain in swallowing, enlarged glands, hæmorrhage, and other symptoms will be anticipated, or perichondritis may set in early, and cause variations of the manifestations. The laryngoscopic appearances vary with the nature, extent,

and seat of the cancer. At an early period the diagnosis may be surrounded with the greatest difficulties, especially when, with diffuse infiltration of the sub-mucous tissue, there is perichondritis. In cancer appearing on the vocal cords, it is easier to determine the nature of the growth, and when other organs are involved. the problem is simple.

Sarcoma, from its excessive tendency to return, may be looked upon as malignant. In the larynx it is not very frequent, and usually spindle-celled.

The course of cancer in the larynx is generally slow, and the cachexia is not usually manifested until a late period. The attempt to destroy or remove a malignant growth in such a situation does not seem hopeful, and in a few weeks, or at most months, recurrence would almost certainly take place, though Schrœtter says he has had four cases in which the disease did not return. Now and then cases occur in which removal or destruction by the galvano-cautery seems practicable, but the difficulty of effectually destroying all the growth gives little encouragement to operate and most authorities recommend palliative treatment and tracheotomy. The early performance of this operation certainly seems to prolong life; Fauvel* thinks always for several months, and sometimes a year, or even two.

Extirpation of the entire human larynx seems to have been performed by P. Heron Watson in 1866. Billroth succeeded in 1873, and Gussenbaur made an artificial vocal apparatus for the patient, who suc-

* "Traité Pratique des Maladies du Larynx."

cumbed to recurrence seven months afterwards. The late Dr. Foulis operated in September, 1877, and I had the opportunity of examining the patient in January, 1878. He spoke easily in a monotone, with a modification of Gussenbaur's apparatus. He died of consumption, March, 1879. Dr. Foulis collected 32 cases of complete, and 6 of partial, excision by various surgeons, for the discussion which he opened at the International Congress. The list was not complete. I had previously cited two cases of partial as distinguished from total removal,* and suggested that *re*-section instead of *ex*-section might often suffice. Resection of one vocal cord for epithelioma had been recorded by Dr. H. S. Chapman,† and in 1878 a man was exhibited at the Clinical Society of London, from whom had been removed both the true and the false cords of both sides, but who could still speak in a gruff monotone, believed to be produced by vibrations of the arytæno-epiglottidean folds. This formidable operation had been undertaken for papilloma, and cannot therefore be compared with cases of malignant growths. It was not shown why less severe measures were not previously resorted to. Since the Congress the operation has continued to be performed at intervals. Dr. Solis Cohen has tabulated 65 cases‡ recorded up to April, 1883, and he concludes that life was not prolonged in malignant cases, and that the patients were less comfortable than those who were tracheotomised. Since then

* *Lancet*, January 26 and February 2, 1878.

† *American Journal of the Medical Sciences*, January, 1878.

‡ "Trans. of College of Physicians of Philadelphia," 1883.

several operations have been performed, especially in Germany, but the total results have not been more favourable.

The future of *re*-section and *ex*-section must be largely influenced by the feelings of the patients for whose relief operation may be proposed. Some with fair prospects of survival would refuse to submit to extirpation. Others may be glad to have life prolonged under the disadvantages imposed by an artificial vocal apparatus. Others would gladly undergo even a desperate operation which held out to them the hope of relief from their sufferings. The less formidable proceeding of partial removal will be more frequently accepted. Great responsibility rests upon us in advising the course to be pursued, and it is to be hoped that the future of extirpation may not be imperilled by a rash resort to it when less radical measures would suffice. Up to the present what I said at the Congress remains true, that the patients to whom I could recommend the operation have either declined the risk, or postponed the decision until complications have arisen to forbid it.

SPECIFIC DISEASES.

Syphilis is more frequent in the larynx than is generally believed. It often comes on long after the disease was supposed to have been eradicated, and is not only very destructive to the tissues, but dangerous to life. Yet it does not set in with violence, but has often proceeded far before advice is sought. I have

discovered considerable destruction when the patient supposed there was little the matter, and even when he had been unconscious of laryngeal trouble. Congestion, or slightly inflamed sore throat may be the first manifestation of the invasion. Later come the intermediate manifestations well described by Dr. Whistler.* Mucous patches, condylomata, gummata, ulcers—destroying the tissues and leaving extensive cicatrices, the contraction of which produces stenosis—perichondritis, necrosis of the cartilages; these are some of the results of syphilis in the larynx. There is little that is characteristic about some of the manifestations of this disease. Hence in some cases the greatest care is required to avoid errors. Other forms bear upon them distinct marks of their origin. The colour to an experienced eye may be suggestive, though it is not pathognomonic. Thus, in syphilitic erythema we often find a dusky, dark-red, or even purple hue, sometimes a mottled appearance which is very different from the rosy or scarlet hue of ordinary catarrhal laryngitis; this difference of hue I have previously pointed out, but it is not recognised by all observers; at the same time it is to be remembered that, at all stages of syphilitic disease, the larynx may be attacked by ordinary catarrh. Hoarseness is often an early symptom, and it has been thought to be characteristic, but impaired voice may occur from many other causes, and the degree of hoarseness or loss of voice depends so much on the position and extent of the morbid process, that the

* "Lectures on Syphilis of the Larynx." 1879.

tone of the *vox syphilitica* can scarcely be distinguished. Œdema may be set up and carry off the patient, and fatal hæmorrhage from deep ulceration was reported by Türck. When proper treatment is not carried out the ravages of the disease are fearful —perhaps involving the whole larynx and trachea— even the parts which are not ulcerated being either injured in the course of the perichondritis, or utterly deformed during cicatrisation; of course the voice is destroyed and life is endangered or lost; nevertheless, treatment enables us to hold this disease in check, or to arrest it in its progress, or to prevent some of its worst results, or to remedy some of the injury it has done. In fig. 6, plate II., is depicted a case in which ulceration occupies most of the superior surface of the epiglottis and one false cord, while one arytænoid is also ulcerated. This patient had greatly neglected himself, and the plate shows the condition of his larynx when I was first consulted. Many such neglected cases have come under my notice which had unfortunately been long treated as simple sore throats.

The treatment must be two-fold; that directed to constitutional state, and that proper to the existing lesion of the larynx. It used to be said that laryngitis was the signal to pour in mercury, but notwithstanding the revival of the tendency to this practice, I still prefer in the majority of cases preparations of iodine and especially iodoform, which can be used both externally and internally. The inhalation of a spray of bichloride of mercury has been advised, but it is impossible to measure the

quantity of the medicine thus introduced into the system; and it seems to me in no way preferable to other remedies which are not capable of doing mischief. In ulceration, pencilling with iodine, the bichloride of mercury, and nitrate of silver are resorted to. If the ulcer be deep, I prefer the solid nitrate, and if rapidly extending, even more potent caustics may be necessary. At the same time iodides must be given in full and frequent doses, the patient being brought as rapidly as possible under the influence of the drug. Condylomata may be touched with solid nitrate of silver. Œdema, abscess, caries of cartilage, and other conditions must be met according to the indications. Stenosis, interfering with breathing as well as the voice, may demand tracheotomy; after which attempts at dilatation may be made, or in some cases it may be well to divide a part of a contracted membraniform cicatricial band, and then dilate. These cases are very trying to patient and physician, but the results are sometimes such as to amply repay both.

Glanders is another disease consequent on the inoculation of an animal poison, and which affects the larynx in a certain proportion of cases, but scarcely ever without the pharynx being also implicated, and even the trachea and bronchi. Œdema may supervene. When recovery has taken place, cicatricial contractions have been observed giving rise to the symptoms due to the deformity.

Laryngo-typhus has been proposed as a name for the laryngeal complication which too often attends, or is set up by typhoid, and may be compared to the

intestinal lesion. At first there is laryngitis, which cannot be distinguished by any special appearance. It may be superficial or deep. Ulceration or abscess follows, and all the sad train of symptoms which mark perichondritis. This complication is very fatal. Lüning* has collected 200 cases. Out of 52 which were not operated on only two recovered. But out of 147 who were tracheotomised 77 recoveries were reported. For the resulting stenosis tracheotomy must be performed. When recovery takes place the tube usually has to be worn for life. Ulceration, if detected early may be treated with more hope. It may have already proceeded far before hoarseness has arrested attention, and just as the patient's convalescence from the fever seems established, he may be seized with urgent dyspnœa, which leads to laryngoscopic examination, when a most grave lesion is detected and will probably prove fatal.

Lupus of the larynx, well described by Dr. Lefferts† was first observed by Türck, who met with four cases chiefly affecting the epiglottis. If looked for, it must be more common than one might suppose from the literature; for only ten cases have been reported, and some of these seem doubtful. Ziemssen reports a case in which there was no lupus either of the pharynx or skin. The treatment must be cod-liver oil, and locally destruction of the new growth by solid nitrate of silver or such other means as may seem indicated.

Leprosy.—In elephantiasis græcorum alterations,

* *Centralbt f. Chirurgie*, 1864.

† *American Journal of the Medical Sciences*, April, 1878.

identical with those on the skin, have been seen in the larynx, and here they are disposed to ulcerate early. In May, 1879, Dr. Elsberg exhibited* at the New York Pathological Society the larynx of a leper, which he had examined with the laryngoscope the previous autumn, and compared the description he then gave of it with the appearances found after death.

OTHER LESIONS.

Injuries and wounds of the larynx result from various accidents, from attempts at homicide or suicide, and are more frequent still in war. Contusions, as in throttling, may cause aphonia, and be soon recovered from. Displacements, fractures of the cartilages, and other injuries will probably require early tracheotomy. In incised wounds, much depends on the position of the injury. In gunshot wounds, there is always the question of the presence of the projectile.

Foreign bodies find their way into the larynx under circumstances already mentioned. The symptoms differ with the shape and position of the body, which may perhaps reach the trachea and pass into one of the bronchi—usually the right. It may be necessary to interfere surgically at a moment's notice, or it may be proper to leave the patient at rest for a time, and trust to the body being coughed up, which has hap-

* *New York Medical Record*, August 2, 1879.

pened in many cases. No general rule can be laid down, save this, that any body which is accessible by laryngoscopic aid, should be removed at once, or it may move to an inaccessible position and necessitate a serious operation or endanger or destroy life. A list of the bodies which have been drawn into the larynx would occupy no small space. These cases require the application of special skill combined with sound common sense.

Consumption, as involving the larynx, is so important that I shall consider its phases in the next chapter. *Nervous derangements, hoarseness, aphonia*, and other affections of the voice, are also too important to be disposed of at the close of a chapter. Besides these, ossification of the cartilages, ankylosis, and other morbid conditions have been noticed. Moreover, the changes caused by the pressure of tumours or other disease external to the larynx itself may be mentioned.

CHAPTER XX.

LARYNGEAL PHTHISIS.—THROAT CONSUMPTION.

LARYNGEAL phthisis will be treated here chiefly from a clinical point of view. With the great pathologists at variance as to its nature, and, indeed, with all the doctrines relating to consumption in a state of chaos, it would be impossible in a brief space to examine the various opinions which have been enunciated. I shall therefore chiefly confine myself to the clinical aspects of the disease, on which an experience of many years, as physician to a Consumption Hospital as well as to the Hospital for Diseases of the Throat, may entitle me to speak. It is as an addition to pulmonary consumption that we mostly meet with laryngeal phthisis; but cases occur in which the disease may be seen in the larynx before it can be detected in the lungs. Everyone is aware how often consumptives suffer in the throat, or have some hoarseness or change in the voice, and perhaps the majority of cases present some variations of colour to the experienced eye, although the patients may not

complain of the throat. About two-thirds, perhaps, of all cases present some throat symptoms. About half are troubled to a greater degree. A smaller number suffer much—thus Louis found ulcerations in one fourth of the bodies he examined.

The symptoms of this formidable disease are those of weakness, succeeded by chronic inflammation and ulceration of the larynx, associated with the general indications of consumption. Chronic laryngitis, or an ordinary sore throat in a person predisposed to consumption, is a very suspicious ailment. I have, to be sure, seen many such cases rapidly recover, and even granular conditions may amend in such constitutions, but there is always danger, and neglected sore throat is likely to excite the fatal disease. Dr. Hunter Mackenzie,* has recorded a case of simple laryngitis on which tubercle was engrafted later and ultimately bacilli were found. Dr. Whipham also mentioned a case at the Clinical Society (April, 1884), and it would be easy to add others.

In the earliest, or premonitory stage, the larynx is generally anæmic, and the same condition prevails over the whole throat. Anæmia of the mucous membrane may be only a part of a general anæmic condition, bnt excluding ordinary causes it is suspicious. At this earliest stage, sometimes the mucous membrane will put on at some spot an appearance of roughness, and this may increase until a vegetation seems to sprout up which may resemble a papilloma—is in fact of epithelial origin and almost, if not quite, identical

* *Lancet*, February 14th, 1884.

with the tissue of ordinary papillomata. Seiler* examined one and found no difference in the structure, "except that the connective tissue stroma was densely infiltrated with small lymphoid cells, so as to be barely distinguishable except by teasing the sections." Sometimes these papillomata spontaneously disappear and later on ulceration is found at their seat. I have, however, seen the mucous surface they had occupied in late phthisis, left quite healthy. It is important not to remove them by operation—a mistake sometimes made—as, if the case prove consumptive, the spot will ulcerate and the patient at once be thrown into an advanced stage of the disease.

A little later congestion takes the place of anæmia; but the hyperæmia in well marked cases differs from that produced by other causes. It may occur only in parts or be diffused. Even in the latter case it looks like congestion implanted on anæmia, and when it occurs in patches the pallor of the intermediate membrane is easily recognised. The vocal cords may become congested, and even when not red, the membrane here, as well as elsewhere, loses its transparency, and assumes a peculiar opacity, very significant to the practised eye. On this, congested vessels are seen coursing in various directions. In other cases the congested mucous membrane presents a dull velvety appearance.

Besides the peculiar congestion we have swelling. This is most marked in the neighbourhood of the arytænoids. Infiltration takes place in the membrane

* "Journ. Am. Med. Assoc.," 1883.

covering the cornicula, and the outline of the parts in the arytæno-epiglottidean folds is lost, so that we have the appearances sometimes thought pathognomonic but which may be simulated by any cause of tumefaction. Compare the swelling in simple inflammation, fig. 1 in plate II., with fig. 5, which shows the swelling in a phthisical case. A similar infiltration often occurs in the epiglottis, and this valve is often deformed: sometimes one side seems most affected; at others it is folded together and in shape resembles a horse-shoe. The swelling may affect both cornicula or one, or one more than the other. It is common for disease in the larynx to begin on the same side as in the chest.

At a still later stage erosions and ulcerations take place. The ulcers are not deep but rather flat, their edges may be pale, but are often red, and an areola of congestion may extend around them. They have certain resemblances to strumous ulceration on the skin. From them small vegetations often sprout up, and may be mistaken for ordinary growths. Occasionally I have seen them of considerable size, and not at all unlike some papillomata. It is obviously important to distinguish them. Ulceration usually begins between the arytænoids, or near the vocal process, but later other parts are affected in the same way, In pl. II., fig. 5, there is an ulcer on the left false cord. The epiglottis is a frequent seat of ulcers. On its posterior surface they are large and flat; at the border they often give a worm-eaten look to the edge.

Such are the more common laryngoscopic appearances in the course of this very fatal disease, but they are capable of almost infinite variations. Perichon-

dritis may take place before or after ulceration, and greatly change the aspect of the image. Hæmorrhage may supervene, and almost always variation in the secretion will alter the view.

The other symptoms too, may vary. Cough and expectoration may both be slight or very troublesome. Dyspnœa may appear early or not until late. But it will be observed that these are not symptoms exclusively relating to the larynx. In any case we may have with laryngeal disease all the varieties of general symptoms met with in pulmonary phthisis. The voice is more dependent on the local condition. Hoarseness is common and appears early. It does not always depend on the congestion of the cords. There may be paresis and early hoarseness, or even aphonia. The voice is usually characterised by weakness, and is liable to frequent changes in pitch; sometimes it is suddenly interrupted, suggesting the existence of a moveable growth, momentarily taking a position which interferes with the movement of the cords. This perhaps arises from secretion acting in such a manner, for the voice is often restored after a sputum is coughed up. It cannot be said there is a characteristic consumptive voice. Pain in the larynx is not uncommon, and tenderness is usually manifested on pressure, but pain in swallowing is far more important. It may appear early and is progressive, often being the source of the patient's greatest misery. With this dysphagia there may be, too, return of the substance through the nose or into the mouth. This begins with liquids, but may also extend to solids; it is the bar to nutrition, caused by this dysphagia,

which often hurries on the case to an early fatal termination. It is partly due to the interference with the action of the epiglottis, permitting aliments to enter the larynx in the act of swallowing, partly to compression of the larynx by the constrictors, and partly to more localised changes, inflammatory or ulcerative.

The constitutional treatment of laryngeal phthisis need not detain us, as it does not differ from that of pulmonary consumption. The local indications differ much in individual cases, and also vary during the progress of the case. But this may be positively asserted, much relief may almost always be afforded and permanent benefit may be conferred by careful topical treatment. Nothwithstanding the naturally fatal character of the disease, cure may sometimes occur. Recoveries have taken place under my care, and in opposition to the majority, I must therefore maintain that laryngeal phthisis is not incurable. Dr. Whistler * has ably marshalled the opinions of laryngologists on this point and is disposed with me to lean to a more favourable prognosis than has too generally been pronounced. Some of my cases were communicated several years ago to the British Medical Association. One of them was in a young woman whose lungs were both diseased as well as her larynx. This had proceeded to ulceration, and the case is one of the most satisfactory instances ever recorded of arrested consumption. A picture of the laryngeal image was published in my "Laryngoscopy and

* *Medical Times*, June 13th and 20th, 1885.

Rhinoscopy," after the patient had for some time resumed her career as an opera-singer.

In the earlier stages, when there is, as it were, only a constitutional chronic laryngitis, remedies appropriate for that condition may be tried, and they will sometimes serve to restrain the morbid action, but only the mildest are to be selected, or mischief may ensue. Sprays are for this reason most suitable. It may be desirable sometimes to supplement them by pencillings, but this method is only to be resorted to when the indications are clear, and only repeated when really required. *Nec nimis valde, nec nimis sæpe*, would be a good motto for those having charge of these cases, for the relief afforded by a well-timed measure often leads the sufferer to desire its repetition in less suitable circumstances. It may be necessary to precede all other measures by anodyne inhalations, which will often have to be largely used in later stages. These anodynes can always be combined with antiseptics which as a necessary consequence of Koch's researches on the influence of bacilli have become the most generally approved remedies. Stimulant inhalations and fumigations are sometimes useful, and they, too, can be antiseptic. Carbolic acid, creasote, terebinthinates, various balsams, and iodine are the most commonly used, but should be carefully prescribed and the effect watched. When astringent, or rather tonic, sprays can be taken, they seem most effective. The objections sometimes made to astringents only apply when the solutions are too concentrated. They should be so weak as to deserve the name of tonics rather than astringents. All

irritants should be avoided in this disease. Carbolic acid properly diluted is distinctly anodyne, and very weak carbolised solutions of astringent salts are often of great service. If bromides and other salines be preferred, they, too, can be carbolised, but simple antiseptic or disinfectant solutions will be equally effectual. Lozenges, gargles, and, other modes of medicating the entire fauces will all, in turn, be useful. When pain and dysphagia become distressing, insufflation of morphia from time to time gives relief, and anodyne inhalations may be called for at more frequent intervals. Then, too, we may enable the patient to swallow by the judicious use of a solution of cocaine. This can be painted on the part so as to produce anæsthesia, or a weak spray may be employed immediately before taking food. When the pain depends on great swelling of a deep red colour the cocaine sometimes causes a diminution of the congestion. When it is due to ulceration some other application may be needed. Occasionally it may be necessary to apply nitrate of silver to the epiglottis when ulceration of the edge is accompanied by intense pain in swallowing, but the strength should be carefully adjusted to the case, and the operation is not to be performed unless absolutely necessary—still less desirable is it to repeat it. Iodoform has been used largely in insufflations, and can be mixed with morphine, but should it impair or destroy the appetite it must be discontinued, as it is of the highest importance to maintain nutrition. Where it agrees, recent researches seem to indicate that its general effect may be beneficial. Pastilles

are a good form for administering it. Acute œdema may occur, and of course must be treated according to the degree of stenosis it produces; but the chronic infiltration we have described is very different, and does not call for scarification. Schmidt, indeed, recommends deep, free incisions, and reports that the operation often gives relief, and that sometimes not even thickening is perceptible after it. But the general course of the disease seems to show that the operation must often merely hasten the ulcerative stage as the wound would not be likely to heal readily, and tubercular infiltration and thickening could not be cured by an incision like simple œdema. In fact *nimia diligentia medici* is to be avoided throughout the treatment, and instead of interfering too much with the larynx, it will be better for the attendant to direct his ingenuity to the problem of maintaining nutrition, which is often sadly interfered with. Local applications to the throat may also restore for a time the power of swallowing, and are therefore a source of the greatest comfort; in many cases this is the chief, almost the only indication. The food must be carefully prepared and presented in a soft or semi-solid state, eggs and milk being largely made use of. In some cases it is necessary to feed the patient through a tube.

Tracheotomy may possibly be required on account of œdema, or the consequences of perichondritis. It has been proposed to perform this operation, in order to afford rest to the larynx, but the disease is not an encouraging one for such an effort.

CHAPTER XXI.

LARYNGEAL NEUROSES. AFFECTIONS OF THE VOICE.

WE have seen that the true vocal cords are in constant movement, alternately approaching and receding from each other, thus closing or opening the glottis. During perfectly quiet respiration they may be watched nearly or quite motionless in the position of rest. On a deep inspiration being taken they separate widely, returning in expiration towards the median line, where they meet on vocalisation. The voice is, in fact, formed by the vibrations of these vocal cords when stretched tensely from front to back across the larynx. Thus we see that interference with their movements will affect both the breathing and the voice. If they cannot approach the median line the voice will be lost. If they cannot be drawn apart the breathing will be distressed in exact proportion to the extent to which the glottis is contracted. If, when brought near each other they cannot be made tense or set in vibration, the voice will be changed or lost according to the extent to which their actions are impaired.

Now the movements of the vocal cords may be impeded by extrinsic circumstances. Thus, swelling of the parts around may prevent their approximation or proper vibration, in which case loss of voice or hoarseness will ensue; ankylosis of the arytænoid cartilage may produce similar interference with vocalisation; a polypus has been spoken of as sometimes coming between the cords. These and other circumstances, including the changes we have witnessed in the diseases already discussed, may any of them prevent the free movements of the vocal cords. But, in addition to all this, the movements may be impaired —paresis, or abolished—paralysis, by intrinsic changes, either myopathic or neuropathic.

When all control over a limb is lost it is said to be paralysed. But palsy is not always complete, and we seek to know what muscles or groups of muscles are unable to act. Just as we speak of the flexors and extensors of a limb, so the muscles which move the vocal cords towards the median line may be called *ad*ductors, while those which withdraw them towards the side of the larynx may be termed *ab*ductors. Now, as the chink of the glottis is widened by the latter and closed by the former, the two groups are also named respectively dilators or openers, and contractors or closers of the glottis. Here, as elsewhere, in health two antagonistic forces balance each other, and if one be interrupted, the other will have full play.

If, then, the action of the *ab*ductors or openers of the glottis (crico-arytænoidei postici) be impaired, their opponents—the *ad*ductors—will be propor-

tionately unrestrained, and by maintaining the vocal cords near the median line reduce to the same extent the aperture of the glottis. The consequence is inspiratory dyspnœa with stridor, which usually comes on gradually, is greatly aggravated by exertion, and suffocative paroxysms are apt to occur. Yet there may be no congestion or inflammation, and the voice may not be affected. There is no hindrance to vocalisation, but the disease affects the respiration in the gravest manner. The passage for air is, in fact, closed in the exact degree in which the cords are not drawn apart. The only help for such a case is to perform tracheotomy. It is the respiratory not the vocal function that is interfered with, and life is therefore at stake. Fortunately, such cases are rare.

When an opposite condition exists—paralysis of the closers of the glottis (crico-arytænoidei laterales, thyro-arytænoidei interni et externi, arytænoideus)—respiration is free, life is not endangered; but inasmuch as the adductors cannot bring the cords to the median line, the voice is lost. This is a very common affection, is frequently associated with hysteria and various nervous disorders, and spoken of as functional, hysterical, or nervous aphonia. Of course the same paralysis may be produced by organic causes. It may be caused by congestion and inflammation, and linger after these have passed by. It may also follow local injury. It is common in anæmia. It frequently occurs in phthisis, and should be distinguished from the effect of the organic lesions so often met with in that disease. It is sometimes of rheumatic origin. Plumbism is another cause. I have also traced it to malarial in-

fluence. Central nerve lesions may also give rise to it, but this is rare.

Instead of both vocal cords, only one may be paralysed. To distinguish such cases the term unilateral paralysis is used, the word bilateral being applied when both cords are affected. I often use the words single and double for the same purpose. The symptoms of paralysis of a single cord are naturally less intense, and the laryngoscopic appearances are characteristic. Thus, when the abductors of one cord fail to act, it is not drawn aside, and only half the glottis is opened. Though the dyspnœa and stridor are not so urgent as in the bilateral, or as I propose to call it, double form, on the least exertion they become very distressing, and various constitutional symptoms will arise in the course of the disease. This paralysis is generally dependent on distant lesions, but it may be produced by local injury, and even by catarrhal inflammation.

When the opposite paralysis of a single cord exists respiration is free, but phonation is affected because the paralysed cord cannot be brought to meet its fellow. The voice is not, however, necessarily lost in this single paralysis, for increased action on the healthy side to some extent compensates for the loss of power on the other. Thus we see in the laryngoscope that on phonation the healthy cord is carried beyond the median line towards the opposite side. In this way the cornicula laryngis sometimes actually cross each other, and the glottis looks oblique. The degree to which the voice is affected depends on the amount of interference with the normal movements. The disease is usually more important in respect to the voice than otherwise; but if there be paralysis of

any other part or any sign of central nerve disease, the case assumes a more serious aspect. It may be set up by catarrh, by syphilis, by chronic metallic poisoning, and by overstraining of the voice.

Instead of the muscles which open and close the glottis, paralysis may affect those concerned in vocalisation. It is true, that for the exercise of this function the adductors must bring the cords together, but that is only a preliminary step. They must then be made tense and set in vibration. The vocal muscles or tensors of the cords (crico-thyroidei and thyro-arytænoidei interni assisted by the crico-arytænoidei) must therefore be called into action. Just as in tuning a harp or violin, we first screw up the strings tight enough to enable them to give out tones; so the tensors may be regarded as stretching the vocal cords before they can be made to vibrate. The larynx is, in fact, the most marvellous of musical instruments, and from its two strings—the vocal cords—are elicited the innumerable variations of the voice. Notwithstanding the simple manner in which we may group the muscular mechanism for attaining this astonishing result, it is necessarily exceedingly complex, and its study as difficult as it is attractive. As in other parts, it is desirable to study the effect of paralysis of individual muscles as well as groups, and a good deal remains to be done in this direction, though much has already been accomplished. The degree of hoarseness or the extent of loss of voice through paresis or paralysis of the vocal apparatus depends very much on the muscles involved, and may vary from absolute aphonia to mere im-

purity of tone. So the patient may have the scale considerably diminished, or may perceive a want of clearness or ease in the production of a single note. In the coarser forms of paralysis of the tensors we see in the laryngoscope that the cords, instead of being stretched tensely across the larynx, are loose, either in part or throughout their length, so that the shape of the glottis is altered by that chink being widened where the cords are not tense. We may thus have an elliptical glottis bounded by two curved cords, or if the paralysis be single the opening is straight on one side and curved on the other. In the same way either the inter-cartilaginous or inter-ligamentous portion of the cords may either of them fail to meet. Other deviations may also be noticed.

The difficulty of deciding the exact deficiency in a given case, is increased by the fact that the individual muscles may not act alone, but that their co-operation is often required to produce the delicate movements of vocalisation. Moreover, in some cases the fibres of a muscle may not all act at once, or in the same direction. To specify the action of which the several laryngeal muscles are capable, is not necessary for our present purpose. We need only remind the reader that their functions may be impaired by organic changes in their own tissues, or by any morbid process in the neighbourhood, *e.g.*, in any of the forms of sore throat we have had to consider. This is why hoarseness, or else inability to emit certain notes, is one of the commonest symptoms of sore throat, which may also give rise to complete aphonia. Either the swelling which accompanies the hyperæmia of the

mucous membrane suffices to impede the delicate movements of the muscular fibres, or else it so acts on the nerves as to produce a similar result. In fact, we may lay it down as a rule that catarrh produces paresis, and cull examples of this condition in catarrh of the bronchi, stomach, and intestines, and still more often the bladder. A parallel case of loss of function in a sensory nerve also occurs when a cold affects the nose. Loss of smell is experienced as soon as the swelling of the membrane produces a sensation of stuffiness. This brings us to consider that the muscular palsy of which we have been treating, is to be traced back to interference with innervation. This may not only occur at the periphery, as in the cases mentioned, but in any part of the trunk of the nerve, or at its origin. In fact, paralysis of the vocal cords is to be studied in the same way as other forms of palsy. While, therefore, only the laryngoscopist can appreciate the varieties of nerve lesions in the larynx, he must bring to their study all the information that has been accumulated respecting the diseases of the nervous system. While fully alive to the possibility of tumours in the course of the recurrent existing, it has happened in cases of laryngeal paralysis that able observers have been unable to detect any such lesions, although long afterwards aneurism of the aorta, or cancer of the œsophagus, became manifest. So tumours in the mediastinum, or at the base of the skull, and central nervous disease, must not be forgotten as possible causes of a paralysis, which might otherwise be attributed to curable conditions.

The treatment of laryngeal paralysis depends so

obviously on the case that general rules are of little value. In purely functional aphonia, most striking results are often achieved, but they are apt not to be permanent when only local measures are employed. Anything which will produce a sudden approximation of the cords—a spasm—even an unexpected mental influence, will restore the voice instantly in hysterical and nervous aphonia. I have often had results from most simple means, which the patients and friends looked upon as almost magical. But in such cases the nervous system requires fortifying, and it is most desirable not to confine our attention to the laryngeal manifestation. The resources of electro-therapeutics are of the greatest value in aphonia. In the defects which result from overstraining of the voice in speaking or singing, we may obtain satisfactory results from a regulated series of vocal gymnastics. It is almost needless to repeat what I have taught for twenty years, that hundreds of cases of failure of the vocal power in the clergy, public speakers, and singers —all who employ the voice professionally—are caused by an improper use of the voice, and may be cured by regulated training; any abnormal condition which may have been brought on or co-exist being of course first removed by appropriate remedies.

Spasm of the vocal cords.—Instead of decreased action in the muscles which move the vocal cords, there may be the opposite condition. When the adductors are thrown into spasmodic action, the glottis is suddenly closed and the breathing interrupted. Then we have the phenomena of so-called spasm of the glottis, already considered in connection

with croup and false croup. Glottic spasm is the feature of various forms of paroxysmal interference with respiration, met with in children, and which have been termed false croup, spasmodic croup, cerebral croup, laryngismus stridulus, child-crowing, crowing-inspiration, suffocative catarrh, Millar's asthma, Kopp's asthma, besides numerous other names. Dr. Simpson* seems to have fairly described it as early as 1761, Millar† followed a few years later, and then Rush.‡ The most complete description of the earlier writers is that of Dr. John Clarke.§

The essential condition in these cases is commonly termed "spasm of the glottis," a phrase manifestly inaccurate, but sufficiently expressive. Spasm of the vocal cords is more correct, as it is excessive action of these which occurs; but, of course, only by their muscles being thrown into undue contraction. This may be due to peripheral causes, or to any irritation in any part of the nerve, or to central disease, just as in the case of paralysis. Moreover, we may divide the irritants into direct and reflex. If now we consider the various ways in which spasm of the cords may occur, and then the extreme liability of children to all convulsive diseases, and of the infantile larynx to take on spasm, we shall be able to understand the difficulties which have been met with in the

* "De Asthmate Infantum Spasmodico." Edin., 1761.

† "Observations on the Asthma and Hooping Cough." London, 1769.

‡ *Philadelphia Gazette*, 1770.

§ "A Peculiar Species of Convulsion in Infants and Children." 1815,

cases described under such various names, and to appreciate the clinical descriptions which have been handed down to us. But here, we should call to mind the important fact that a similar train of symptoms may certainly be produced by paralysis of the dilators of the glottis, which was conjectured by Dr. Ley * in pre-laryngoscopic times to be the essential cause of the attacks.

The phenomena are so characteristic of spasm, that in the majority of cases we must recognise that condition, but paralysis also occurs, though more rarely. The degree of spasm accounts for the symptoms; when complete the breathing is arrested, when incomplete the inspiratory stridor is the leading phenomenon. If momentarily only, there is merely the catch in the breath, often observed in the early stage. If prolonged it may destroy life. Generally, the spasm relaxes as soon as insensibility approaches.

Though most common as an affection of childhood, spasm may attack adults, but in these paralysis is more frequent. Among the numerous possible causes of spasm, it has been again suggested by Franz Heller that acid fluid from the stomach may pass through the cardiac orifice, and when the position is favourable reach the larynx. Perhaps this may be admitted as one cause—an occasional one; for we know that the contents of the stomach are easily eructated, besides which when the patient lies on the side with the head low, fluids easily slip from that viscus

* "A Treatise on Laryngismus Stridulus." London: 1836.

along the œsophagus. Dr. Solis Cohen suggested* that the epiglottis might become impacted, so as to cause spasmodic cough and suffocative paroxysms. He has since recorded † two cases in which sudden incarceration of this valve was found to exist, and on being released the paroxysm subsided. It is obvious that such impaction would arrest respiration as readily as spasm of the vocal cords. In this case, however, laryngeal spasm is not a misnomer, since the epiglottis is supposed to be first drawn down by inordinate action of the arytæno-epiglottidean muscles, and then to become impacted.

Laryngeal vertigo.—The attacks described under this name by Charcot, and of which cases have been published by Gasquet, Krishaber, Gray, Lefferts, Massei, and M'Bride, seem to be cases of laryngeal spasm occurring in adults. Charcot seems to regard them as a kind of giddiness, the irritation being conveyed by the superior laryngeal nerve. This is the sensory nerve of the larynx and glottic spasm is produced by stimulating it. The patients have all been neurotic and in some of them other spasmodic affections have been observed.

Spasmodic cough affects both children and adults, and is closely allied to the diseases already mentioned and other nervous disorders. Constant barking spasmodic cough may continue for weeks without producing local effect. Hysterical and nervous laryngeal coughs are recognised by many, and are

† "Diseases of the Throat." New York: 1872.

* *Medical and Surgical Reporter.* Philadelphia, March 16, 1878.

very intractable. Spasmodic action of the cords is also met with in whooping-cough, and I have observed that anomalous cases of laryngeal spasm seem often to be but the remnants of that disease.

Stammering of the Vocal Cords.—Under the title of "a hitherto undescribed laryngeal affection," I submitted to the annual meeting of the British Medical Association (1879) a brief description of a disease which seems to be due to a defect in the power of co-ordinating the intrinsic muscles of the larynx, and which I proposed to call vocal stammering, or stammering of the vocal cords. In this disease the vocal apparatus fails at intervals to properly carry out the behests of the will, giving rise to sudden interruptions to the voice, while the articulating power may be unaffected. As in the generally recognised impediments of speech, the harmonious action of the groups of muscles engaged in articulation is disturbed; so in the vocal derangement I have discovered there is an analogous laryngeal motor disturbance. The disordered co-ordination which so commonly interferes with the utterance of syllables may disturb the production of voice only. Thus we see the movements required for producing syllables perfectly performed, while the vocal sound is at intervals suddenly arrested. There is an intermittent momentary voiceless condition. This may cause the patient to stop speaking, or he may continue a sentence from which some words are lost to the listener. A clergyman suffering from this disease in an aggravated degree was exceedingly distressed by his consciousness of the fact that, though he kept on reading the service,

some of the words dropped soundless from him, and his friends watched his lips moving in the usual way when words and phrases were lost in silence.

The sudden interruption of the function of the vocal cords in such cases is most difficult to demonstrate; it is very unlikely to occur during the utterance of such sounds as are usually emitted in laryngoscopic examinations. I had to watch for a long period and to devise special methods before obtaining ocular demonstration of this stammering of the vocal cords. Isolated sounds in the most confirmed stammerers may be correctly articulated; so also in these vocal impediments the patient can emit separate tones, and may even run up and down the gamut with ease. But now and then with certain combined sounds rapidly produced in succession, a sudden hesitation or temporary arrest of the laryngeal movements will occur. The vocal cords hesitate or tremble for an instant at a point not sufficiently approximated for vocalisation, where they move as with a series of ineffectual efforts to obey the will or display the paroxysmal spasmodic or irregular actions seen in the mouths of confirmed stammerers, or the less distinct interferences with utterance called "hesitation of speech." In fact, most of the derangements commonly grouped under the expressive term impediments of speech may henceforth be said to have their counterparts in similar vocal impediments occurring within the larynx.

These and other nervous affections may prove a heavy burden to persons with whose occupations they do not interfere, while they may altogether suspend the work of clergymen, barristers, singers, and others who make a professional use of the voice.

Affections of sensory nerves.—Anæsthesia, hyperæsthesia, neuralgia, and paræsthesia have been established as sometimes affecting the larynx. I have long recognised these conditions, and recently they have received more attention. Diminution and abolition of sensation in the throat is known as a sign of approaching death, as well as of diphtherial paralysis. I have found distinct laryngeal anæsthesia in the latter as well as in labio-glosso-pharyngeal paralysis, and although this has only lately been generally admitted, von Ziemssen, Chairou, Schnitzler, and others have reported cases. The same condition accompanies some other nervous affections.

Neuralgia of the larynx is not very frequent, and moderate degrees of hyperæsthesia are difficult to appreciate in consequence of the great range of normal sensibility in different persons. Nevertheless, I have had cases which were unmistakeable. Dr. Clinton Wagner has recorded an interesting case.*

The spasmodic cough alluded to above would seem to be associated with hyperæsthesia, if not dependent upon it, in connection, perhaps, with increased reflex irritability.

Not only the degree of sensibility, but the kind, may be discriminated. Professor Elsberg distinguishes† between—*a*, tactile, by which temperature and pressure are appreciated; *b*, dolorous, painful; and *c*, reflex. I divide the first group into two—viz., tactile and thermal, as I have sometimes found one of these diminished or abolished, while the other remained unimpaired.

* *New York Medical Record*, 1875.
† *Phil. Med. Times*, Oct., 1884.

The treatment of laryngeal neuroses is to be conducted with care. In electro-therapeutics we have resources, which are not sufficiently appreciated, while other local and constitutional treatment should not be neglected. Sometimes we are baffled by an obstinacy which nothing changes, at others we are rewarded with ready success. Anæsthetics and anodynes are sometimes of use locally, but seldom serve any purpose given internally. This is why patients with pure laryngeal cough, spasm, or other nervous affections of the throat, may be half poisoned by narcotics without procuring relief. Yet when the system has been vainly saturated with these drugs, the recognition of the true nature of the case enables us to apply remedies, the effect of which may appear little short of marvellous. But these successes are not achieved by mere happy guesses. They are but the application of general principles to special purposes, and illustrate in the domain of the nervous system the connection already pointed out in so many other respects between affections of the throat and other diseases.

CHAPTER XXII.

AFFECTIONS OF THE TRACHEA AND BRONCHI.

THE trachea, or windpipe, is the portion of the air-tube between the larynx and the bifurcation into the bronchi, opposite the third dorsal vertebra, from four to four and a-half inches long, and from three-fourths of an inch to an inch in diameter. It is composed of from fifteen to twenty rings of cartilage, connected by membrane, together with muscular, areolar, and elastic tissues. The organ is supplied with vessels and nerves, and lined with mucous membrane, having ciliated epithelium and glands. The rings of the trachea are not perfect. Behind there is a portion wanting, and the space is filled up by the membrane. The tracheal image, as reflected in the mirror, is portrayed on plate II., fig. 3, in which the openings of the bronchi are also seen. The skilled laryngoscopist will not need directions as to the best way of examining the image, and the beginner will probably not be able to see below the larynx. The natural angle at

the junction of the larynx and trachea must be reduced as much as possible by inclining the head backwards, and the light must be sufficient to illuminate the whole tube. Care must be taken not to mistake for disease the normal pulsation sometimes observed in the lateral walls just above the bifurcation. This pulsation, first pointed out by Gerhardt, and fully described by Schrötter, is probably produced by the vessels which lie in contact with the tube.

Congestion and Inflammation of the windpipe are common enough as accompaniments of similar conditions in the larynx above or the bronchi below. The position of the trachea between those organs, and the continuity of its mucous membrane with theirs, expose it to the same causes of disease. *Tracheitis* does, however, occur as a separate lesion, though this is rare, unless occasioned by direct irritation. Pain is usually present, and palpitation cannot be tolerated so well as in health. The voice will be unaffected so long as the larynx is not also involved, but cough is a constant symptom. The intimate connection of tracheal irritation with various forms of cough has been proved by numerous experiments. In tracheitis the cough is often painful, loud, harsh, noisy, and possesses almost a metallic ring, sometimes termed brassy. The expectoration is scanty, often tenacious, and is occasionally said to appear in rings. A more distinct exudation may take place. In croup we have seen this process affecting the whole trachea to a great extent; and, indeed, the old name of croup—*cynanche trachealis*—shows that this part of the air-tube was supposed to

be the seat of croup and the home of false membrane. In the trachea, inflammation does seem to tend towards the pouring out of denser fluids, and when infiltration occurs it is more apt to be fibrinous than serous. Abscess, ulceration, and the other consequences of inflammation may occur. The trachea also participates in the morbid changes produced by phthisis, syphilis, and other diseases, &c. It may equally be the seat of morbid growths.

Stenosis, or narrowing of the trachea, may be caused by disease in its own walls, including cicatricial contractions and neoplasms; or by external compression from tumours, &c. The air-tube being here at its widest, as contraction usually occurs gradually, the symptoms often seem to creep on imperceptibly. As soon as stenosis interferes with free respiration, there will be quickened or laboured breathing—most perceived on exertion. The difficulty is entirely in inspiration. The breathing is noisy, tubular. The voice seems muffled, no doubt on account of the diminished current of air on which the vocal cords can act. Cough is not always present, but is often produced by the cause of the stenosis. After a time paroxysms of severe dyspnœa are apt to occur. When they set in, the stenosis is usually considerable, and the patient may perish in one of them. The slower the process of constriction, the less the dyspnœa produced. Indeed, it is surprising how great a degree of narrowing may be tolerated, provided it takes place very gradually. In tracheal dyspnœa, even when severe, the larynx does not move up and down with the activity it displays in

laryngeal stenosis. As the case advances there is danger of pneumonia being induced. Instead of this, cerebral symptoms sometimes supervene.

Cicatricial bands and membranes may be the cause of the stenosis. These are usually the result of syphilitic ulceration, to which also contractions are often due. Tumours in the trachea are rare, but those in the neighbourhood often compress the tube. At a very early stage congestion may be seen, showing that in these cases, and in all diseases of the trachea, the mirror will lend us most valuable service.

Spasm of the trachea has received scarcely any attention, and yet the possibility of its occurrence was recognised by Porter,* who cited a case reported in the *Edinburgh Medical Journal*, in which dissection showed "a contraction of the trachea to more than two-thirds of its diameter, and one inch and a half in length, situated mid-way between the larynx and the bifurcation of the trachea. The contraction relaxed gradually after the tube was slit, so that the day following, the part did not appear contracted or in a state of disease of any kind."

Something similar seems to have been witnessed during life by the late Dr. Scott Alison, who described† a reduction in the calibre of the trachea affecting the whole circumference of the tube at a spot about an inch above the bifurcation. He attributed the condition to a reduction of the soft posterior part, and

* "Surgical Pathology of the Larynx and Trachea." London, 1837.

† "Morbid Conditions of the Throat and Consumption." London, 1867.

this in its turn to "an undue amount of muscular contraction." Exacerbations recurred in the dyspnœa and it affected both inspiration and expiration. The narrowing seems to have persisted for some time in Dr. Alison's cases, and gave rise to emphysema in some, while in others it simulated consumption. Nevertheless, as no other lesions were found, except congestion, I have thought it well to include them under spasm rather than stenosis. I would add that I recognise other forms of spasm of the trachea more closely allied on the one hand to laryngismus stridulus, and on the other to asthma. I have pointed out the significance of paroxysms of tracheal dyspnœa in gradual occlusion of the tube, and inasmuch as the difficulty is not continuous it seems natural to attribute to spasm a share in its production. I may add that catarrh and other causes may set up spasm of the trachea, though this is less frequent and withal less dangerous than spasm of the larynx. We need not here discuss the connection between bronchial spasm and asthma, but may observe that tracheal spasm, too, deserves consideration in connection with the same malady. Of course, in any case, laryngeal spasm produced by the exciting cause may supervene on the tracheal affection.

Treatment.—Tracheal diseases should be managed like those of the larynx on the one hand, or those of the bronchi on the other, according to the nature, position, and extent of the lesion, and the predominance of either set of symptoms—laryngeal or bronchial. The trachea can be influenced jointly with the larynx and bronchi by the various remedies we

have described, especially by inhalations, fumigations and atomised sprays. A more localised application may be made by the pipette, or a laryngeal syringe or douche with a suitable tube can be advantageously employed in this situation. The instrument must be carried down carefully during an inspiration between the vocal cords. In the same way powders can be applied by means of a suitable insufflator. Solid escharotics can also be conveyed to the part by means of proper directors. Lastly, some other operative procedures have been accomplished.

Tracheal diseases are often exceedingly obstinate, and their treatment is beset with numerous difficulties, but we must not be discouraged. I have recently obtained unexpected success in long standing disease of the trachea when ordinary laryngeal treatment had been previously pursued, but vainly—because the larynx was not the part affected.

With regard to stenosis, the indications depend so entirely on the nature of each individual case that it would be unprofitable to offer any general directions for their management.

Foreign bodies which have gained access to the larynx, may pass further along the air tube, the position in which they are arrested depending on their size, shape, &c. If not arrested before the bifurcation, they seem more frequently to pass into the right bronchus than the left, because the septum is slightly to the left of the median line, and the calibre of the right bronchus is therefore rather the larger. As these bodies, however, are moveable, they have been known to pass from one to the other. The symptoms

will necessarily vary with the degree of obstruction to respiration, and therefore with the position and size of the intruding substance. When this has passed the glottis, it is, generally speaking, beyond the reach of laryngoscopal operation, and an opening into the air tube has to be made. Very often the foreign body is spontaneously expelled by a cough the moment the opening is made; but sometimes further interference may be called for. This, however, should not be undertaken unless urgently needed, for a subsequent cough often expels the body through the opening, which, in such case, should be large enough. Moreover, it may be well to observe that foreign bodies have sometimes remained for considerable periods in the air passages, and then been expelled *per vias naturales*, so that there is not always the urgency for immediate operation that has been generally taught. But every case must be considered by itself, and in reference to the indications present, for the circumstances are so various that scarcely any two cases will occur to the practitioner which are in every respect alike.

CHAPTER XXIII.

EXTERNAL SORE THROAT.

THE term *angina externa*, or external sore throat was originally applied to mumps, but it may with equal propriety be applied to cases of enlarged glands, tumours of the neck, and other swellings in this neighbourhood, which, by pressure or otherwise, affect the throat.

Parotitis, cynanche parotidea, or mumps, is often epidemic—occasionally it runs through a school, and so seems contagious. It begins as a catarrh, or angina; after a few hours the gland swells largely, stiffening the jaw, and disfiguring the face. Swallowing for some time is often impossible, and there may be considerable feverishness. The disease lasts about forty-eight hours, and then subsides gradually, terminating in resolution, as systematic writers say. It furnishes one of the best-marked instances of metastasis. The treatment is confined to not doing too much. Warmth locally, by dry flannels or fomentations, a diaphoretic or a few doses of aconite, and a saline aperient, if indicated, are the chief measures.

The metastasis is to be treated on general principles without reference to its origin, except that warmth and stimulants may be applied to the gland, with a view of inducing a return of the ailment.

Suppuration may occur in the cellular tissue around the gland—more especially in scrofulous children. In these cases poultices may be applied, and, if needful, an opening made.

Phlegmonous inflammation of the connective tissue in front of the neck is a very serious disease. It may terminate in resolution, abscess, sloughing, or gangrene. It mostly follows the exanthemata or typhus. I have seen it in diphtheria. Sometimes it appears as a primary affection. The disease has been called *Angina Ludovici*, after Ludwig, who fully described it; but other cases of diffuse inflammation in this neighbourhood are allied to those he described. It usually begins in the supra-hyoid region, and extends in all directions, pushing the floor of the mouth upwards and sometimes reaching the sternum. The swelling is very great, painful and hard. The lower jaw cannot be moved; compression of the larynx, trachea, and vessels of the neck, produce various symptoms. If resolution occur, it is long before the swelling goes down. Suppuration is more common—a number of abscesses forming—or the pus burrows in various directions, or fistulæ are established. Gangrenous sloughs separate, and the disease is not only very dangerous, but demands constant vigilance and most judicious management. Sometimes it seems to arise in the tissue around the salivary glands; at others it appears to be set up by, or at any rate, a

similar affection is associated with, periostitis of the lower jaw. Erysipelas and the puerperal state seem also to give rise to it.

The connective tissue and muscles may be transformed into a brown semi-fluid mass mixed with sloughs. The parotid and submaxillary glands have been destroyed by gangrene, and secondary deposits have been found in various organs. It has been thought that antiphlogistics could prevent suppuration, but the disease is only seen in debilitated subjects. Pus has to be evacuated, and it is advised to search for it by deep incisions whenever the symptoms are urgent and no pointing is perceptible. When found, the insertion of deep hooks and the separation of the fascia is also advised. It is scarcely necessary to inculcate caution in using the knife in this region, when the position of parts is changed or obscured by the infiltration and swelling.

Cynanche thyroidea, or bronchocele, or goître, is a chronic enlargement of the thyroid body—a disease endemic in some localities, and generally attributed to the character of the water drunk by the inhabitants. Its appearance is well known, and it is therefore unnecessary to describe all its varieties. Of late years they have been treated with more effect than formerly. The interstitial injection of iodine, proposed by Luton and Lücke, has given me some good results. I adopted it at an early period, a gentleman who had seen Lücke's early cases having communicated it to me. Since then I have applied electrolysis to the cure of bronchocele. I have also found the injection of ergotine successful.

Excision of the thyroid gland has been successfully carried out, but could only be thought of as an extreme measure. In some cases division of the isthmus has been substituted for the more formidable operation. It has lately been shown that excision of the thyroid may involve ulterior consequences which had not been anticipated. In 1883, Dr. Kocher of Berne, published some interesting observations tending to show that removal of this body may set up a peculiar cachexia, terminating in myxœdema. Prof. Bruns has reported a corroborative case: the thyroid of a child two years old having been extirpated in 1867, a great change in its temperament was noticed five months afterwards, and on inquiry in 1884, Prof. Bruns found the patient alive, twenty years old, but a dwarf and a cretin. This was communicated to the Clinical Society of London, by Dr. Semon (October 24th, 1884) and naturally excited attention. Experiments on dogs and rabbits by Schiff, Albertoni, and Tizzoni, showed that excision may be followed by serious effects. Additional light has been thrown upon the subject by the careful researches of Mr. Victor Horsley.

In the Brown Lectures for 1884 (*Lancet*, Dec. 27th, 1884) Mr. Horsley described in detail the results of experimental thyroidectomies performed on monkeys. He employed antiseptic precautions, and in this his experiments differed from those of Schiff. He found excision of the thyroid to be followed by an increase of mucin in the tissues, an increase in the activity of the muciparous glands, and the assumption of a muciparous function by glands which normally yield

no mucin; profound changes in the blood, viz., a diminution in the number of red blood corpuscles, and also leucocytosis; and, lastly, nervous symptoms, viz., tremors, rigidity, paresis, and imbecility occurring successively, and ending in coma and death. Mr Horsley advanced the theory that the function of the thyroid was twofold, viz. (*a*) glandular, secreting mucin, (*b*) hæmapoietic.

In the Brown Lectures for the present year, delivered as these pages are passing through the press (December, 1885), Mr. Horsley described some further experiments made during the past year, and the conclusions to which he had been led. The lectures being as yet unpublished, the following summary of his views is based upon notes taken during the delivery of the lectures. Mr. Horsley adduced further proofs of the hæmapoietic function of the thyroid. By observations made with Dr. Gowers' hæmacytometer, he had found a marked excess of red blood corpuscles in the blood returning from the gland in the thyroid vein, compared with that going to the gland in the artery. In his former experiments he had only recognised two stages in the symptoms of the myxœdema artificially produced. By the application of heat he had been able to prolong the lives of the animals, and now recognised three stages, viz., mucinoid, neurotic, and atrophic. The recognition of this stage, he remarked, showed a distinction between myxœdema and cretinism. In this case the animal lived through myxœdema into cretinism. In his recent course Mr. Horsley stated that the influence of the thyroid gland on nutrition was most marked in young animals. He

even went so far as to remark that he would parody a statement of Dr. Hughlings Jackson, and say that a man's age depended less upon the number of times he had been round the sun than upon the condition of his thyroid gland. In his third lecture Mr. Horsley described at some length the symptoms following removal of the thyroid. These were due to degeneration of nerve-centres ensuing on arrested metabolism in the thyroid gland. They occurred in the following order :—(1) Tremor—constant fine tremor, at the rate of from 8 to 10 per second ; (2) Paresis—the extensors being first affected—followed by contractures ; (3) Paralysis, coming on in attacks resembling hemiplegia, and disappearing in a few hours, especially if warmth were applied. My space does not allow of further description of Mr. Horsley's interesting and important work in this direction ; but before quitting this subject I would remark that Charcot* has noted general tremor as a symptom of exophthalmic goître. The tremor, says Charcot, is extremely rapid, and is nearly general, but does not affect the muscles of the head and neck or the intrinsic muscles of the hands or feet. I can corroborate Charcot's observation as to these tremors.

In *Exophthalmic goître*, or Graves's disease—or, as the Germans call it, Basedow's disease—we have besides the enlarged thyroid, the condition of the eye and the heart to consider. The rapid general tremors are mentioned in the last paragraph. They are most interesting cases, though their management is at-

* *Gazette des Hôpitaux*, 1885.

tended with difficulty. Hence they are too often neglected.

Acute thyroiditis is very rare, and sometimes proves rapidly fatal. Suppuration may take place, but I have had rapid resolution ending in speedy recovery. A local abscess may occur in enlarged thyroid, and prove a step towards recovery, but is not a desirable complication. I have seen it in exophthalmic goître also: Fibrous and osseous formations occur in the thyroid. Tubercle and cancer are exceeding rare.

Cysts and *other tumours* occur in this neighbourhood. Among them may be mentioned enlarged glands, induration of the sterno-mastoid muscle which is not very rare in children, enlargement of the bursæ of the hyoid bone and thyroid cartilage, fatty and fibrous tumours, and, very rare, cancer. Aneurisms, too, have appeared in such situations as to give rise to errors. Cysts may be tapped and injected with iodine or perchloride of iron. The management of other tumours must depend on their situation, connections, and nature.

Enlarged thymus may produce throat symptoms and this body may undergo degeneration, or be the seat of cancer. Acute inflammation is also said to occasionally affect it.

Enlarged bronchial glands, thoracic tumours, and other possible occurrences may be mentioned as additional proofs of the necessity for bringing extensive information to bear on every case of disease in this region.

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